AU/ACSC/018/1999-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

RETENTION OF COMPUTER NETWORK SYSTEM

ADMINISTRATORS IN THE AIR FORCE

by

Joseph E. Buder, Major, USAF
Amanda W. Gladney, Major, USAF
James B. Nazar, Major, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Lieutenant Colonel Deanna A. Paulk

Maxwell Air Force Base, Alabama

April 1999

Disclaimer

The views expressed in this academic research paper are those of the author(s) and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

Contents

Illustrations

Tables

Preface

The need to move information from point to point, whether administrative electronic mail (e-mail) or command and control data is paramount to accomplishing all Air Force missions. As communications officers and commanders we have faced a constant demand from our operational customers to keep the network on the air. To do this, we need highly trained system administration technicians to ensure the information gets from desk-to-desk to across the globe. However, we have at the same time witnessed a mass exodus of our very best network technicians. Lured by a more stable and stationary work environment, often at double the pay, our best find it necessary to make a better life for them and their families.

This research paper results from the communications career field perspective of ensuring world class network support to our operational customers at the same time we watch our skilled technicians separate in search of higher compensation and less time away from home. Our goal is to highlight the nature of the exodus problem and offer solutions as to how to train and retain our best for the betterment of the Air Force.

We would like to acknowledge the guidance of our faculty advisor, Lt Col Deanna Paulk, for helping maintain our focus and Lt Col Harold Hemmings, ACSC/OAS, for his helpful insights into the communications career field. Additional thanks go to the many network professionals around the globe who were willing to share their opinions on this subject.

Abstract

The Air Force has been undergoing dramatic changes throughout the decade. Historically, three factors have contributed to this: the geopolitical environment, emerging technological innovations, and new operational concepts. Technology has shaped the strategies and tactics used by the Air Force to meet its operational and strategic objectives. In fact, this revolution in military affairs has created an age of information. Challenging this transformation of military operations are people. To be more specific, the lack of people. One of the Air Force's biggest areas of concern is retention. One career field affected is the communications field. The Air Force has been losing system administrators (SAs) at a dramatic rate. As the Air Force becomes increasingly dependent on information systems to ensure optimum performance of our warfighters and our warfighting capability, the need for skilled SAs to operate and maintain these systems will also increase. The need to deploy to austere and possibly hostile locations will require enlisted personnel to operate these systems.

Chapter 1

Introduction

Tomorrow's forces will be faced with quantum leaps in technology. The military must have the high-quality Marine, sailor, airman and soldier who can rapidly assimilate that changing technology and convert it to combat capability.

—Terry Stevens, Colonel, USAF (Retired)

The Retention Problem

The Armed Forces has undergone many changes over the last 15 years. One of the biggest areas that has been impacted by these changes is in the area of personnel. The Air Force has been restructuring, modernizing, and downsizing since 1990 with new technology and operational concepts offering an alternative to the larger Air Force of the 1970s and 80s. The Department of Defense has developed a critical reliance on technology and the Air Force of the new millennium demands robust computer networks and skilled technicians to operate them. Mirroring the Air Force in its requirement for advanced networking capabilities and architecture is private industry. The technology industry is experiencing unabated growth and with it considerable competition for skilled information technology (IT) workers. Networking is the number one growth area in every industry nationwide and is the most difficult skill to find.[1] Now that the Air Force has become increasingly dependent on networks, e-mail, and mission critical systems, it is time to address the challenges of ensuring there are skilled personnel to install, operate, and maintain these systems. This paper will address the retention problem for

1

system administrators (SAs)[2] in the Air Force. If there is a problem, then what sound retention strategy can the Air Force employ to keep these people in the military and simultaneously ensure the mission is met?

Background and Problem Significance

The Air Force has adopted six core competencies of which one is Information Superiority. Information Superiority demands robust computer networks and skilled technicians to operate them. The future of the communications-computer systems role will be to prepare to meet the challenges of the future battlespace. The Chairman of the Joint Chiefs of Staff is concentrating on emerging technologies and information superiority. At the root of electronically linking this operational architecture together, hooking up dissimilar systems, and tying together seemingly incompatible hardware and software are the military's network SAs.[3] The learning curve to become a fully qualified SA is long and costly. Once trained, they have skills valued both inside and outside of the Air Force; therein creating a dilemma.

In 1986, Air Force end-strength was over 608,000 airmen and by the end of 1996, a decade later, Air Force manpower decreased 35 percent.[4] With end-strengths less than 400,000, the Air Force is the smallest it has been since the Berlin Airlift in 1948.[5] Corporately, the Air Force has struggled with retention issues for many years. The Air Force goal for retention is 55, 75, and 95 percent for first, second, and career airmen respectively. Since 1994, the communications and information community has lagged behind the Air Force goal as a whole. The clear concern is with our second term and career airmen. From 1995-1998, the retention percentages were 74, 71, 63, and 56 respectively for the second term airmen and 95, 95, 92, and 90 for the career airmen.[6] Retention has become a major issue and is the basis of this research paper.

Roles of the System Administrator

The 3C0X1 Communications-Computer system operations technician is a multi-talented enlisted member. Their responsibilities include information system security, communications security, message center operations, managing mainframe computer databases, base video teleconferencing, telephone operations and switchboard duties. These are very broad skills. In addition to being able to conduct these duties, those individuals designated to work specifically in the network control center (SAs) are responsible for the tasks listed in Table 1 according to AFI 33-115, Network Management.

Table 1. 3C0X1 System Administrator Roles

1)	Provide core network services which includes a variety of services for base customers. The system administrator must configure, install and manage the entire network. This effort includes providing technical advice and solutions for software, hardware and network connectivity requirements.
2)	Provide software assistance support for core applications.
3)	Establish methods to manage new network technologies for incorporation into the network. This task includes preparing network migration and upgrade plans.
4)	Implement information/network protection requirements.
5)	Perform configuration standardization and interface engineering.
6)	Perform contract management for network support. This function includes consolidating and evaluating managed network and system components as candidates for contract maintenance support.
7)	Perform network budget planning for all network requirements and operations functions.
8)	Maintain a 24-hour on-call help desk for trouble calls and first look maintenance and monitor system advisory notices and heads up messages.

Source: AFI 33-115

These duties are organic to base requirements and are also conducted in deployed environments.

Importance to the Air Force

The Air Force must have the ability to respond to changing science and technology.[7] In order to meet this expectation, the Air Force needs personnel that are highly trained and motivated. Nearly all Air Force and Air Force-related systems are network dependent. Air Force personnel require access to unclassified and classified networks and the internet to link planners and operators together and everyone to the information they need to accomplish the current mission. Under the Air Expeditionary Force operational and employment concepts, the same systems a military member uses in-garrison will be used while deployed. So the airmen managing the network at home are responsible for these same systems when deployed. Contract support cannot reliably be counted on during deployment cycles, permissive environments, or hostility phases. Blue suit technicians must, and will operate the network-based systems that carry the information to the warfighter.

Methodology Used to Research the Problem

This is a non-experimental research project. The research design provides a logical method to ascertain whether there is a retention problem for system administrators in the United States Air Force. The targeted 3C0X1 population consists of 7,318 airmen.[8] The large population base makes measurement of the total population impractical. Therefore, a sample size of 30 SAs is desired.[9] Additionally, the research design includes interviews from communications squadron commanders to obtain a leadership perspective on the retention problem. Only United States Air Force personnel will be interviewed.

The researchers will interview these individuals via e-mail, telephone, and in person. The interview questions (Appendices A, B, and C) have two parts. Part I establishes a profile of each respondent. Part II elicits participants to express their opinion related to system administrator

retention issues. The interview questions will provide the primary data to be analyzed to draw conclusions. While names were requested on the interview questions, they will not be used in this research. All respondents were made aware that participation in this research is voluntary and the data provided will be kept confidential.

In addition to primary data obtained through interviews, the researchers conducted a vast review of printed and electronic materials to gain Air Force leadership perspectives. This review also focused on industry issues in order to obtain a perspective into non-military concerns and to draw conclusions of value to the researchers' thesis. All costs to conduct this study were absorbed by the researchers.

Assumptions and Limitations

Under the Air Expeditionary Force concept, the Air Force will require blue suit system administrators to deploy in support of the warfighters' information and technological needs. Additionally, the Air Force will continue to perform A-76 outsourcing studies in order to meet budgetary and manpower considerations. This paper will not address impacts to outsourcing positions, rather, it focuses on our continuing need to retain a certain number of enlisted system administrators. The limitation to this research is that the sample size will only reflect a small portion of the population, thereby affecting the validity of the study. In order to have the most valid data possible, the researchers chose to e-mail the interview questions to every Air Force communications squadron commander for support. Given the voluntary nature of the interview, the researchers realize the number of respondents may be limited, however the researchers desire to have a minimum of 30 participants as that provides a statistically reliable sample. Lastly, the interview questions themselves may create a reaction among the respondents, thereby affecting the reliability of the research. Respondents may respond to the interview inconsistent with their

feelings just because it is an interview. This research does not try to delineate at what stage (e.g., first/second term or career) in which the respondents may make the decision to stay in the Air Force or not. Therefore, the research will concentrate solely on the respondents' views of the current situation regarding system administrator retention.

Finally, the objectives of this research are to determine if there is a retention problem among system administrations; if so what is the nature of the problem; and further, what strategies might the Air Force do to correct it.

Notes

[1] Natalie Engler, "Jobs Forecast '98: Desperate Measures," *Computer World*, available from http://www.computerworld.com/home/print9497.nsf/all/SL52crjobs1773A.

[2] System Administrator (SA), Information System (IS) technician, and Information Technology (IT) professional all generally refer to computer network workers and are used interchangeably throughout this paper.

[3] General Henry H. Shelton, "A Word From the New Chairman," reprinted from *Joint Forces Quarterly*, Autumn-Winter 1997-1998, 5.

[4] Major Scott J. Lempe, "The Drawdown: Impact on Our Ability to Recruit, Retain and Sustain the Force of 2001," Maxwell AFB, Alabama: Air University, Air Command and Staff College Research Paper, 1998, 2.

[5] Ibid., 2.

[6] MSgt Mark Behrle, "3CXXX Manning Statistics briefing," 17 June 1998, available from http://www.afca.scott.af.mil/3c.

[7] "Global Engagement: A Vision for the 21st Century Air Force," CD-ROM.

[8] Briefing, Air Force Communications Agency, subject: "3CXXX Manning Statistics," January 1999, available from http://www.afca.scott.af.mil/3c/manning.html.

[9] Elizabethann O'Sullivan and Gary R. Russel, Research Methods for Public Administrators (White Plains, NY:Longman Publishers USA, 1995), 138. A sample of about 30 is the minimum considered necessary for statistical stability and is only a rough, lower estimate for most statistical techniques.

Chapter 2

Training

Changing missions, organizations, and rapid technology advances demand the Air Force retain a highly trained, educated, specialized, and motivated force.[1] Retaining qualified system administrators in the Air Force is difficult and growing one is timely and costly. In the early part of this decade when the network era exploded onto the scene, installations were forced to use a hobby shop approach to administering base-level networks. The most computer literate troops, from computer operators and maintainers to medical technicians and radar maintenance troops administered the networks while the corporate Air Force established manpower standards, defined standardized skill sets, and developed the formal training necessary to institutionalize a professional workforce. This overall effort, known as Operationalizing and Professionalizing the Network (O/PTN) drives all network-related training.[2]

Initial 3C0X1 Training and Upgrade Requirements

Network technicians earn their initial 3-level skill rating through a 13-week, in-residence training course at Keesler Air Force Base. Each student receives basic training in all 3C0X1 skills—it is not limited to strictly system administration functions.[3] Task specific training needed to support specific base-level network functions is obtained after arriving at the gaining communications squadron. This training is predominantly in the form of Computer Based Training (CBTs).

The Air Force has delineated a strict series of prerequisites and training requirements for individuals in the computer-communications systems, and specifically the SA career field. Spelled out in the 3C0XX Career Field Education and Training Plan (CFETP), the career field manager, commanders, trainers, and trainees use these requirements to develop, conduct, and manage efficient and effective training appropriate for all phases of the individual's career. The 3C0X1 CFETP defines the multiple roles of the network system to include installation, operation, and first-level maintenance of network segments. Whether helping train a customer on his desktop computer applications or programming inter-nodal routing algorithms, the technician must apply varied and technically demanding skills. The CFETP further expresses the need for ascensions into the 3C0X1 career field to have strong mathematical and computer science skills.[4]

Complicating the training issue is the fact that no standard network operating system or e-mail capability has been designated for use across the Air Force. Rather, Headquarters Air Force and MAJCOMs have identified preferred network capabilities to guide base-level organizations in their network development and support efforts. This has not eliminated the multiple network capabilities in use but has significantly reduced the variety. In order to handle these differing systems, the 3C0X1 school curriculum and CBTs provide both broad-based, skills leveling training as well as network-specific training.

On-the-Job Training

A 3-level apprentice has basic skills but not enough to operate the network. Supervisors and trainers must derive the necessary Air Force Job Qualification Standard (AFJQS) and related CBTs spelled out in the CFETP to develop and implement an on-the-job training program for each assigned network technician. The Air Force Communications Agency (AFCA) developed

seven draft training tracks, directed at Network Control Center personnel to satisfy the CFETP and to certify network professionals in support of the O/PTN effort. These training tracks are Help Desk Operations, Workgroup Management, Network Management, Network Administration, Database Administration, Information Protection Operations, and Functional System Administration. The most recent versions are available through links on the AFCA homepage.[5]

Gaining certification as a network professional is a lengthy process. In addition to technical school, each network-training track includes multiple CBTs and two tracks require outside training. Table 2 delineates the training tracks and associated training time. Each track has core training requirements. Most tracks have additional CBTs that apply to the specific network operating system the SA supports (e.g., Microsoft NT, Novell, and UNIX.) Total training time is listed in weeks and assumes the trainee dedicates 40 hours weekly to completing the required CBTs.

Table 2. 3C0C1 Training Tracks

Training Track	Additional School Length	Core CBT (hours)	Operating System CBTs (hours)	Total Training Time (weeks)
Help Desk Administration	N/A	90	Microsoft NT—303 Novell—291 UNIX—112	10 9.5 5
Workgroup Management	N/A	56	NT—356 Novell—154 UNIX--32	10 5 2
Network Management	7-weeks Network System Support	244	N/A	13
Network Administration	N/A	130	NT—327 Novell—301 UNIX--153	11.5 11 7
Database Administration	N/A	360	N/A	9
Information Protection	7-weeks (via Access Research Corp)	433	N/A	18

Functional System Administration	N/A	74	NT—210 Novell—359 UNIX--112	7 11 4.5

Within the seven training tracks there is some overlap. CBTs from one training track may apply to another. Table 3 illustrates CBTs common to the Help Desk Operations and Network Administration training tracks. A CBT completed in support of one track applies equally to the other.[6] Although it appears an individual could become certified in more than one training track, O/PTN dictates that individuals focus on completing one track before moving on to another to ensure professional network support.

Table 3. Comparison of Help Desk and Network Administration Training Tracks

Help Desk Operations CBTs	CBT Training Hours	Network Administration CBTs	CBT Training Hours
Internetworking	44	Internetworking	48
Info Tech Core Concepts	42	Info Tech Core Concepts	42
Internet Security	4 0	Internet Security Routed Network Protocols	4 44
Microsoft Training	303	MS NT 4.0	327
Novell Netware 4.1	149	Novell Netware 4.11	301
UNIX	153	UNIX	112

Training Provided by the Civilian Sector

Many organizations find it necessary to send troops to commercial sites for specific training. A week of focused, out-of-office training can quickly raise the technician's abilities on the job. The reward for this goes to both the unit and the individual. As the military initially installed its many networks, it relied heavily on civilian sector training because of the lack of

in-house training. The advent of CBTs for training has significantly reduced the perceived need for this support.

The military will always rely on outside sources for network hardware and software to run business applications. Vendors generally release new training courses in conjunction with major upgrades or new systems. If an organization wants to install one of these new systems, it is often necessary to send one or more of its SAs to formal training offered by the vendor in order to properly install, configure, and operate the new system. The only alternative is to learn the new system in an off-line environment before installing it on the live network and then continue to train on-the-job. This method increases the risk of network degradation due to improper installation or operation and may not realize the maximum potential of the new hardware or software.

Cost Versus Required Skill Levels

The cost of training offers two debates. First, how much training does an individual need to ensure adequate support to network operations? Second, at what skill-level or rank do you target individuals for training? In the first case, the commander budgets to provide commercial training for his personnel. One commander stated during his interview that he was allotted $40,000 and still had an $80,000 annual training shortfall.[7] This training reduces already slim budgets that might otherwise purchase new computers or improve the quality of the work center.

The second debate offers a more complicated issue. A single, one-week commercial course for router training costs a unit $2,500 per person plus travel and per diem costs.[8] Full certification as a Microsoft or Novell technician can cost thousands more. Does the commander send his best technician or an average performer? What if the choice is between a senior airman with 18 months left on his enlistment or an average performing staff sergeant who has recently

reenlisted? The former could have the greatest impact on the unit's mission while the latter

simply maintains the status quo. A commander must carefully consider who gets training and

when to provide it as the certification earned can reap a considerable paycheck in the private

sector.[9]

Notes

[1] Sheila Nataraj Kirby and Harry J. Thie, "Managing the Enlisted Force: Whistling in the Wind?" *Armed Forces & Society, v*ol. 24, no. 4 (summer 1998): 567-587.

[2] White Paper on Operationalizating and Professionalizing the Help Desk, prepared by Air Force Communications Agency, 25 January 1999, available from http:/www.afca.af.mil/optn.

[3] Briefing, 333rd TRS/TTC, subject: Basic 3C0X1 Course Details*,* available from http://www.keesler.af.mil/333trs/cflight/ops/new_ers.

[4] 3C0X1 Career Field Education and Training Plan, available from http://www.afca.af.mil

[5] Briefing, Air Force Communications Agency, subject: Training and Certifying Network Professionals, available from http://www.afca.af.mil/optn.

[6] Ibid.

[7] Interview January 1999.

[8] Ibid.

[9] Ibid.

Chapter 3

Current and Projected Incentives

The assumption of this research project is that there is a retention problem for system administrators and one contributing factor may be pay. If this is indeed the case, the compensation of the civilian industry must be compared to that available to Air Force personnel. This section will examine what the civilian sector may be offering the enlisted administrator to leave the service and what the Air Force is offering to maintain the manpower in this field.

Compensation Compared to Industry Norms

The average basic compensation offered to SAs in civilian industry is significantly higher than what the Air Force offers its enlisted personnel. Table 4 compares the average salary of civilian network administrators with the comparable level of expertise in the Air Force.[1] Although civilian compensation varies between companies and geographic regions, the averages shown in the table are substantially higher than the enlisted equivalents (see Figure 1).

Even though salaries are high in the civilian world, it doesn't mean retention is any less a problem for private employers than it is for the Air Force. According to the same survey used above, 50 percent of the respondents did not feel their salary was sufficient compensation for their job responsibilities, and 30 percent planned to leave their present employment for a better salary.[2]

Table 4. Civilian vs. Enlisted Compensation

Civilian Years of Service	Average Annual Civilian Salary	Total Annual Enlisted Compensation	Percent Below Civilian Pay	Enlisted Grade & Years of Service
2 – 5	$43,602	$24,638	43%	**E-4 / 4 yrs.**
6 – 8	$49,681	$27,546	45%	**E-5 / 6 yrs.**
9 – 12	$42,888	$31,639	26%	**E-6 / 10 yrs.**
Over 12	$64,268	$36,859	43%	**E-7 / 14 yrs.**

Source: Hurly, Hanna. "Payday's Payoffs: Earn the Maximum Wage," *Network Magazine*, vol. 13, no. 7, June 1998, 42. 1998 Monthly Basic Pay Table, *www.dfas.mil/money/milpay/paychart/1998.pdf*
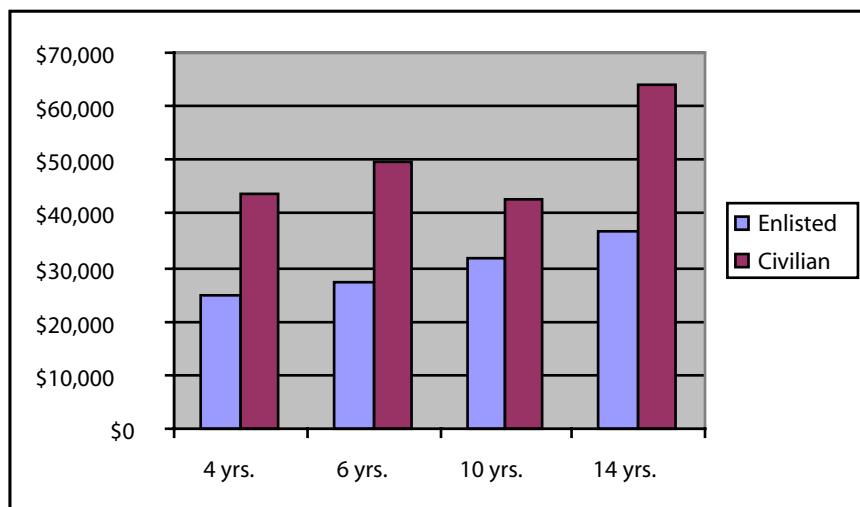
Figure 1. Civilian vs. Enlisted Pay for System Administrators

Unlike the Air Force, in civilian industry more skills always means more pay (see Figure 2).[3] Enlisted SAs are not paid any bonus (other than Selective Reenlistment Bonus (SRB)) for any special skills, regardless of how valuable those skills are to the Air Force.
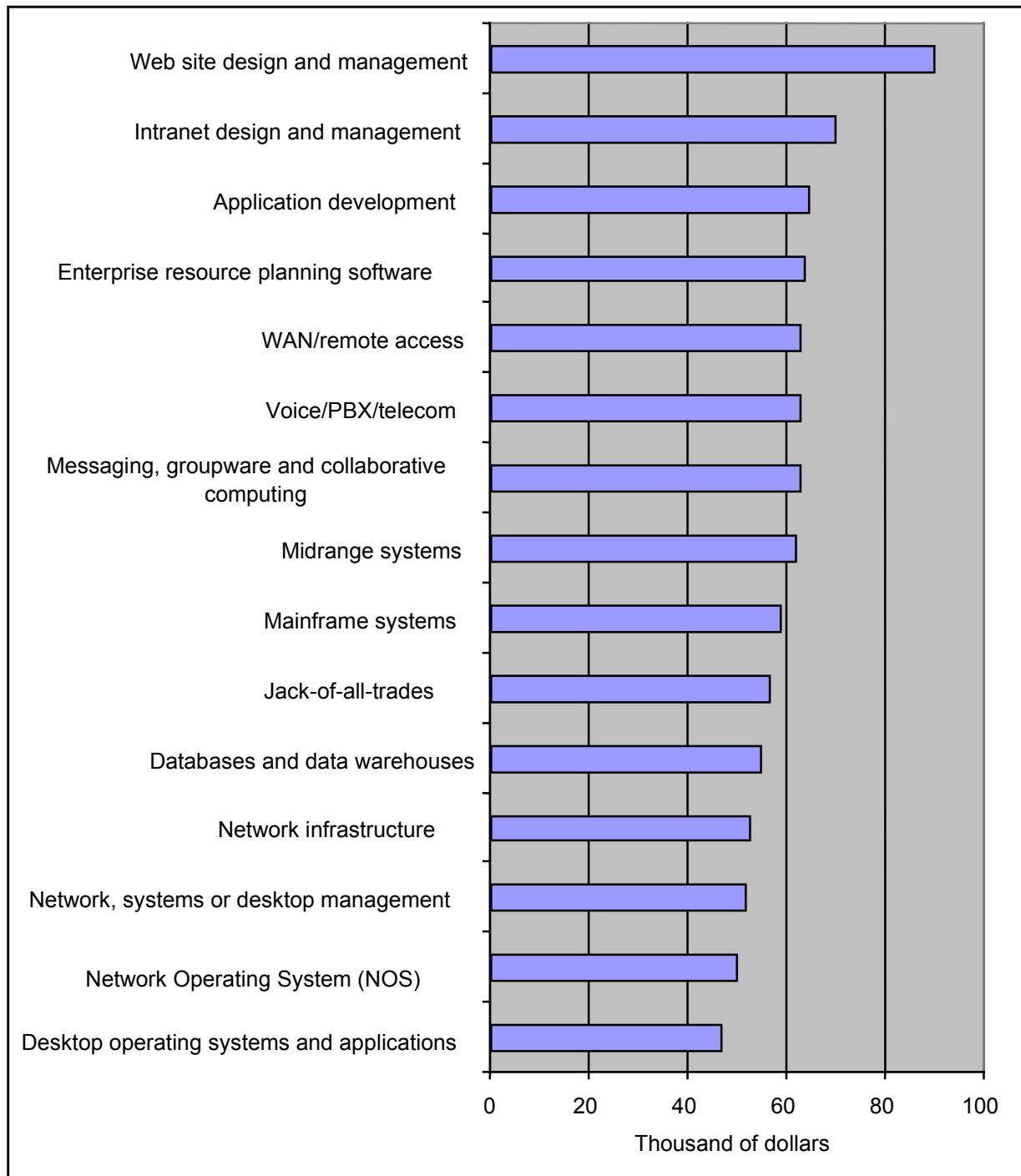
Figure 2. Average Civilian Salary by Expertise Area

For instance, the increase in intranet and web management salaries (up nearly 9 percent in 1998 over the average for 1997) should be of special concern to the Air Force.[4] The rapid growth of intranets and web services in the civilian world is even greater than the growth in the

Air Force. Over 97 percent of those companies surveyed indicated they are deploying or plan to deploy a corporate intranet or web site.[5] This growth in the civilian sector and accompanying high salaries will be especially tempting to enlisted SAs with these skills.

Along with the growth in deployment of web technologies, the corporate world is also highly interested in security and access control. According to a survey of private corporations, network security was considered a top challenge in 1998, cited by 19 percent of the respondents.[6]

Recent proposals, if enacted, will improve incentive and retirement packages offered to enlisted personnel. A 4.4 percent pay raise has been proposed for fiscal year 2000 followed with annual increases of 3.9 percent through the year 2005.[7] These current pay increases positively impact retirement pay which is based on basic pay. A second improvement targets raises for mid-grade NCOs. These raises will vary from 0.5 to 5.5 percent depending on grade and will take effect July 1, 2000.[8] These targeted raises should help retention in the mid-career grades. The third part of the package will return the 20-year retirement to 50 percent of basic pay, fixing a major grumble from military personnel who entered the service after 1986 and are under the Redux plan.[9]

These proposed raises in basic pay are designed to keep military pay slightly ahead of the *average* private sector wage growth.[10] Wage growth for IS workers is well above average. One report put the average annual salary increase for IS personnel for 1996 at 9.2 percent and 13.7 percent for 1997.[11] It is probable that the future salary growth of private IS workers will be higher than the 4.4 and 3.9 percent annual increases proposed to basic military pay. The targeted basic pay increases proposed for NCOs may help narrow this gap, but it is likely future increases in pay for civilian SAs will significantly outstrip increases to basic pay for enlisted administrators.

Initial Enlistment Incentives

The only current incentive to initial enlistment into the 3C0X1 career field is the training. Initial enlistment bonuses of $2,000 for a 4-year commitment and $6,000 for a 6-year commitment have been discussed by career field managers, but nothing is official as of this report.[12] Initial technical school training for the 3C0X1 career field and follow-on computer based training (CBT) and course work leading to professional certification are a strong incentive to initial enlistment. The seven 3C0X1 training tracks will lead to certification within the Air Force and provide significant training in proprietary systems such as Microsoft Windows NT, Novell IntranetWare, UNIX, and Cisco routers and switches that can lead to industry specific certifications recognized by civilian industry.

Reenlistment Bonuses

The 3C0X1 career field has been targeted for selective reenlistment bonuses (SRB) since 1996. Both Zone A and Zone B SRBs have gone up every year since the SRB was introduced (see Table 5).

Table 5. 3C0X1 SRB, 1996 - 1998

	Zone A Multiplier	Zone B Multiplier	Zone C Multiplier
1996	0.5	0.5	-
1997	0.5	1.0	-
1998 (Jun)	1.5	3.0	-
1998 (Dec)	2.0	4.0	1.0

Source: "AF announces reenlistment bonus changes," *Air Force News*, May 96, www.af.mil; "SRB list undergoes changes after semi-annual review," *Air Force News,* Jul 23, 1997, www.af.mil; "AF announces revised Selective Reenlistment Bonus list," *Air Force News*, Jun 22, 1998, www.af.mil; *"R*e-enlistment bonus program expanded," *Air Force Times,* Jan 4, 1999, 8

In Dec 1998, a Zone C SRB was offered to the career field for the first time. The bonuses shown in Table 6 reflect the base pay as of 1 Jan 99 with 3.6 percent pay raise.[13]

Table 6. 18 Dec 1998 SRB for 3C0X1

Grade	Zone	Time in Service	Base Pay	Term of Enlistment	SRB Multiplier	Total SRB
E-4	A	4 yrs.	$1,326.60	4/6 yrs.	2.0	$10,612.80 / 15,919.20
E-5	A	5 yrs.	$1,514.70	4/6 yrs.	2.0	$12,117.20 / 18,176.60
E-5	B	7 yrs.	$1,614.30	4/6 yrs.	4.0	$25,828.80 / 38,743.20
E-6	B	9 yrs.	$1,844.10	4/6 yrs.	4.0	$29,505.60 / 44,258.40
E-5	C	10 yrs.	$1746,30	4/6 yrs.	1.0	$6,985.20 / 10,477.80
E-6	C	12 yrs.	$2010.00	4/6 yrs.	1.0	$8,040.00 / 12,060.00
E-7	C	14 yrs.	$2,216.70	4/6 yrs.	1.0	$8,866.80 / 13,300.20

Source: 18 Dec *1998 3C Selective Reenlistment Bonus,*
www.afca.scott.af.mil/3c/docs/SRBSCDec.doc

Bonuses are fairly common among civilian network staff. A recent survey revealed that 39 percent of civilian network administrators would be receiving a bonus for 1998. Those reporting a bonus received from under $1,000 to $10,000. The distribution of bonuses to civilian network professionals is shown in Figure 3.[14]

$5,000 -
$10,000
17%

< $1,000
23%

$3,000 -
$5,000
11%

$1,000 -
$3,000
49%
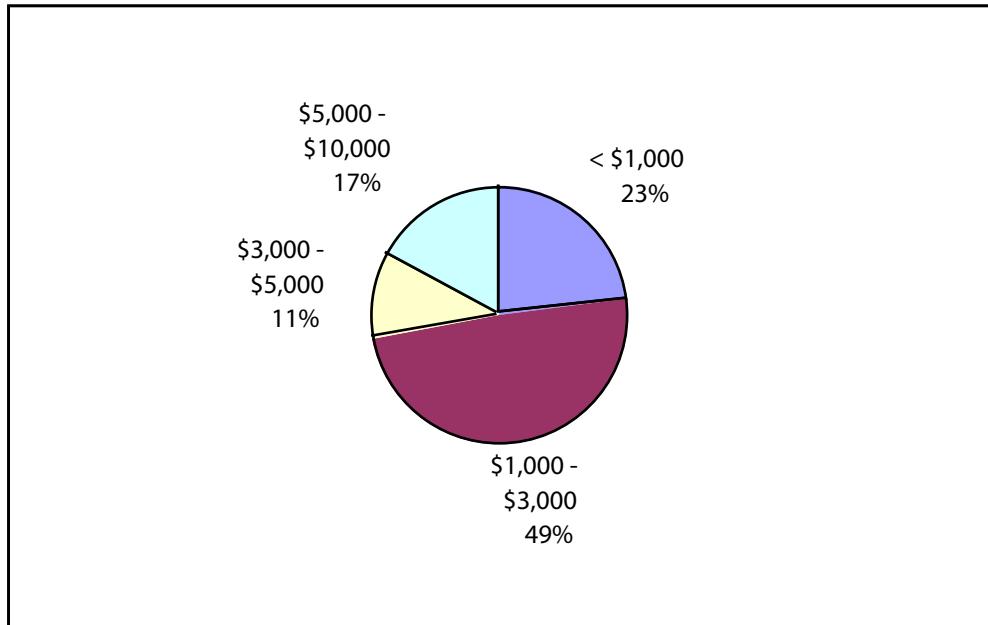
Figure 3. Civilian Bonus Distribution

Another survey indicated that bonuses and other non-salary compensation packages (401(k) plans, profit sharing, compensatory time, pension plan, stock options, etc.) would probably be offered to low-level network staff positions as the demand for skilled people continues to rise.[15] These types of bonuses and incentives may erode the appeal of the SRB to keep enlisted SAs in the Air Force. Civilian employers, offering lucrative signing bonuses with limited time commitments, may also challenge the appeal of Air Force reenlistment bonuses.

Notes

[1] Hanna Hurley. "Payday's Payoff: Earn the Maximum Wage," *Network Magazine*, vol. 13, no. 7 (June 1998): 34-46. The civilian pay figures are based on a scientifically selected sample of network professionals across the United States. The compensation calculated for enlisted administrators is based on basic pay for the particular grade and years of service added to Basic Allowance for Housing (BAH) at the With Dependent rate and Basic Allowance for Subsistence (BAS).

[2] Ibid., 34.

[3] Bob Vivlino, "Network Computing Salary Survey," *Network Computing*, 7 January 1997, available from http://www.networkcomputing.com/802/802f3.html.

[4] Bob Vivlino, "1998 Intranet/Web Mangers' Salary Survey," *Network Computing*, available from http://www.networkcomputing.com/918/websal98.html.

Notes

[5] Ibid.

[6] Ibid.

[7] "Defense Secretary announces significant pay and retirement improvements for FY 2000," *Air Force News,* 22 December 1998, available from http://www.af.mil.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Hanna Hurley. "Payday's Payoff: Earn the Maximum Wage," *Network Magazine*, vol. 13, no. 7 (June 1998): 42.

[12] MSgt Mark Behrle, AFCIC/XPF, telephone conversation, 9 November 1998.

[13] "Re-enlistment bonus program expanded," *Air Force Times,* (4 January 1999): 8. The Zone A SRB is applicable to personnel reenlisting at 21 month to 6 years of service and the Zone B SRB is applicable to personnel reenlisting between 6 and 10 years of service. The Zone C SRB is offered to personnel reenlisting between 10 and 14 years of service. Half the bonus is paid at the time of reenlistment with the remainder paid in equal installments over the reenlistment period. The bonus received equals the monthly base pay times the number of reenlistment years times the SRB multiplier

[14] Hanna Hurley. "Payday's Payoff: Earn the Maximum Wage," *Network Magazine*, vol. 13, no. 7 (June 1998): 42.

[15] Bob Vivlino, "1998 Intranet/Web Mangers' Salary Survey," *Network Computing*, available from http://www.networkcomputing.com/918/websal98.html.

Chapter 4

Retention Discussion

Low unemployment on the outside; propensity to want to be with the family all the time; concerns over outsourcing; the perception that we have 'erosion of benefits' and a lot of anecdotal misinformation [are] causing our troops to leave by the numbers.

—CMSgt Eric Benkin, CMSgt of the Air Force

The mission impact due to retention of quality and qualified troops is evident at all levels. Retention rates of 3C0X1s in Figure 4 show a greater portion of first-term airmen declining to reenlist in the Air Force. Reenlistment of second-term NCOs is well below Air Force goals.[1]

	1994	1995	1996	1997	1998
■ First Term	49	74	60	55	58
■ Second Term	81	74	71	63	56
□ Career	95	95	95	92	90

AF Career Goal: 95%

AF 2nd Term Goal: 75%

AF 1st Term Goal: 55%
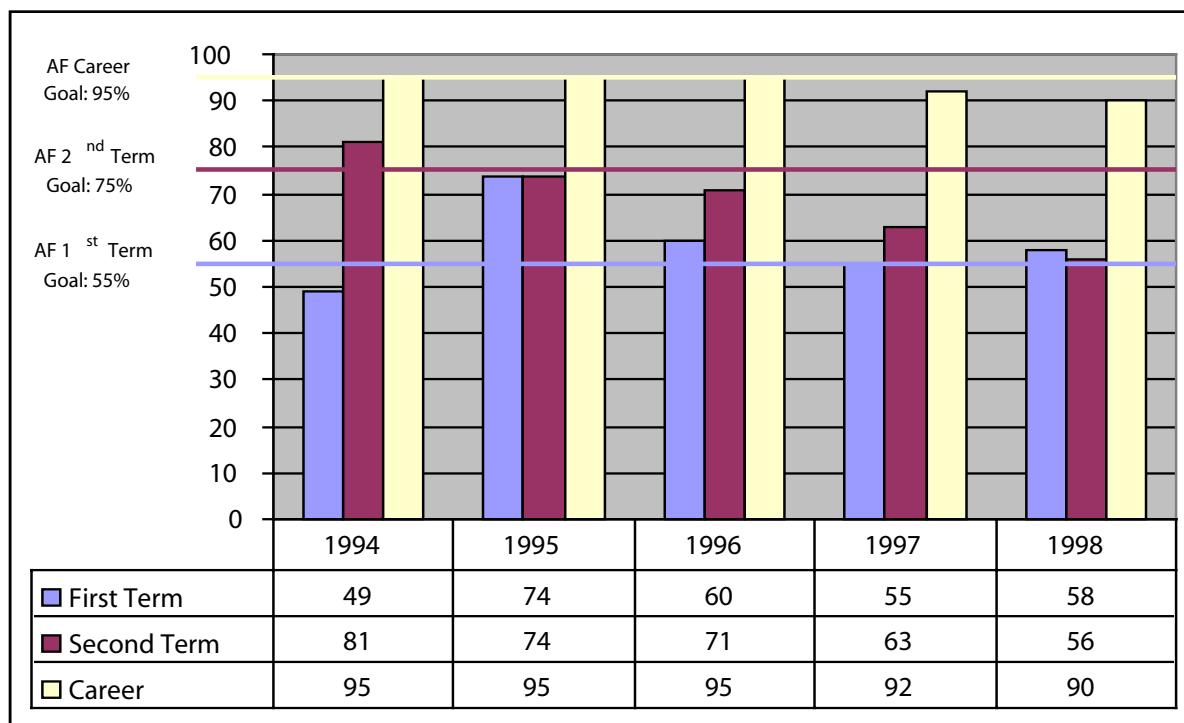
Figure 4. 3C0X1 Retention Percentages

The May 1998 Quarterly Career Field Health Update gave 3C0X1 retention a stoplight rating of red. The same report gave sustainment a rating of yellow (see Figure 5).[2]

	E1-3	E-4	E-5	E-6	E-7
Authorized (FY98)	1162	2802	2251	1174	800
Projected (FY03)	965	2408	1991	1049	711
Assigned	1334	2180	2186	1036	740
Sustainment	1688	2016	1710	891	606
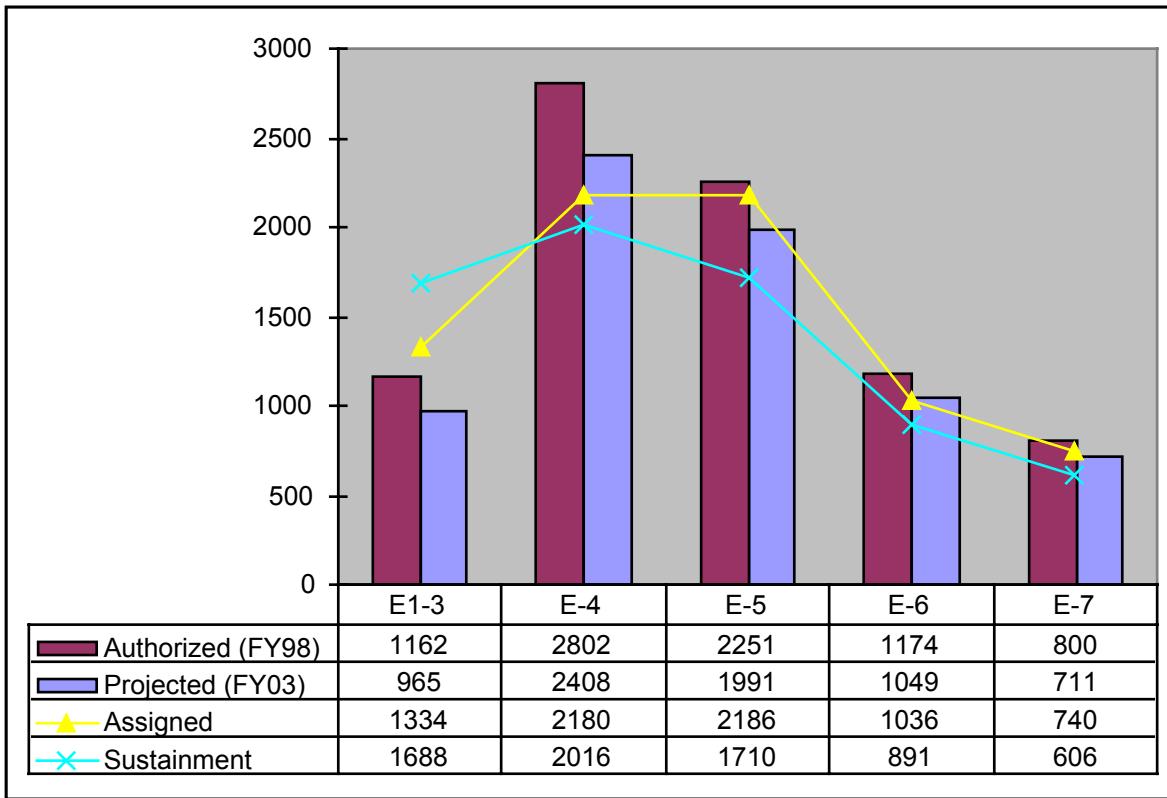
Figure 5. 3C0X1 Manning and Sustainment, May 1998

The issues have suddenly moved up on the agendas of Air Force senior leaders where this is uncharted ground for current leaders who are more skilled at cutting the force than sustaining it.[3] The yellow caution light is now on for 3C0X1 career field manning.[4] Figure 6 shows the most current 3C0X1 manning levels across all ranks.[5] Manning for the 3C0X1 career field is 88 percent, with overall manning for the 3C career field at 90 percent.[6]

Enlisted retention is driven by several factors: skill training and experience, unit manning levels, career progression, pay and compensation, quality of life, family programs, personnel tempo, benefit packages, fairness to the individual, a stable and secure future, and the health of the US economy.[7] This section examines the retention issue through the perspectives of

communications unit commanders, operational unit commanders, and the enlisted SAs derived through personal interviews.
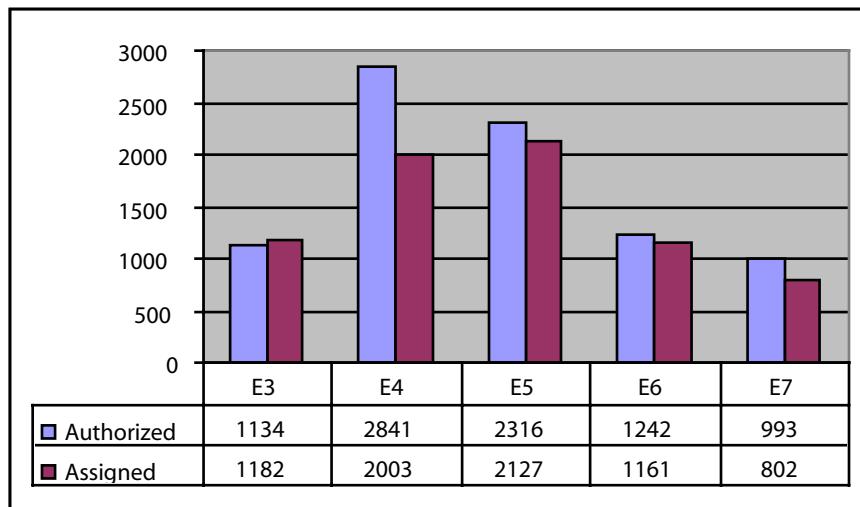
Figure 6. 3C0X1 Manning Levels, 31 Dec 1998

	E3	E4	E5	E6	E7
Authorized	1134	2841	2316	1242	993
Assigned	1182	2003	2127	1161	802

Communications Unit Commander Perspectives

Over the course of the 1990's the Air Force has transitioned from a drawdown force to one focused on retention. During that period, management of the 3C0X1 career field became, in a sense, a moving target. Outsourcing and Privatization (O&P) efforts, changing technology, implementation of Air Expeditionary Force concepts, career field mergers, and redefining network management roles at all levels of command have complicated the effort. O&P is strictly a resources issue—manpower cuts and reduced budgets demand outsourcing of support functions. An AFCA white paper on "Operationalizing and Professionalizing" the Help Desk argues that, individually, bases must closely review their wartime commitments to determine how much military experience is needed to prosecute the war. Commanders must balance these operational support issues against the need to outsource and thereby cutting manpower and costs.[8] Their dilemma is a factor for many of the issues identified in their responses.

Communications squadron commanders were interviewed to determine three issues. First, do they perceive a retention problem? Second, how do commanders interpret the needs of their SAs? Third, what incentives do commanders use to keep qualified troops on active duty and do these incentives work?[9]

Do commanders perceive a system administrator retention problem in the Air Force? Yes, every commander interviewed expressed a concern over their ability to retain adequate numbers of qualified SAs.[10] However, they viewed the retention issue at varying levels. Twelve of thirteen commanders found it hard to retain highly trained computer specialists especially SAs with turnover rates as high as 80 percent.[11] While the personnel pipeline keeps their organizations adequately filled with new ascensions they could not replace those 12 to 15-year highly trained, highly qualified SAs.[12] One commander viewed the problem as no different than any other Air Force specialty. The strong economy in the United States draws all military members.[13] Every commander expressed concern over the loss of SAs due to the costs in training time and funding needed to produce a fully qualified technician.[14] One commander went further to note that the best troops seemed more inclined to separate than less capable personnel who found security in an Air Force job. The impact on the squadron was therefore magnified.[15]

Given that commanders perceive a retention problem, they must understand what compels SAs to separate in order to find methods to stem the outflow. Commanders sensed a variety of reasons including better pay, fewer deployments, greater family stability, O&P, and a general leadership void. Without exception, every commander cited money as a cause for separating.[16] Military pay is set by law without regard to specialties (minor allowances are provided through SRBs). Private industry can offer several times the pay possible in the Air Force. Pay may be a

big draw but interview responses suggest it's not the only reason troops leave service. The Air Force places a great demand on the troops through deployments and permanent changes of station. Many of the commanders highlighted the family needs of the troops. They're tired of the constant deployments whether they're in a combat communications squadron or at a fixed base.[17] Overseas assignments and deployments generate less excitement now than in the past. Commanders sense this but understand they have little control over the taskings. Deployments further tax the squadron as the commanders must deploy fully qualified troops to provide critical network support to warfighters in a hostile area of responsibility.[18]

Commanders have some control over O&P issues. Manpower and budget reductions drive the O&P effort. The commander validates the criticality of the squadron's positions and influences whether or not to eliminate systems administration positions. The fact that many squadrons have outsourced network support reduces the number of positions available for the 3C0X1 to fill, leading troops to choose separation over filling other functions. One commander expressed the concern for lack of leadership in senior communications-computer professionals. The current leadership message, as perceived by the commander through his troops, is to contract out entirely the network support function and thereby eliminating all blue suit functions. Troops feel little loyalty from the Air Force and choose to take the money (private industry) and run.[19]

As important to understanding why troops are leaving, understanding why they stay offers additional insight to others on the extent of the problem while offering commanders potential solutions that can be applied at the unit level. In contrast to troops desiring stability, commanders cited there are troops that enjoy a mobile and challenging lifestyle. A commander of an engineering and installation squadron met both the needs of his troops and the mission by assigning a system administrator to a high deployment position. The win-win situation provided

the administrator the best of two worlds—deployments and a technically challenging job.[20] Other commanders found the troops stayed because of the long-held beliefs of job security and service to country.[21]

What strategies do commanders use to retain system administrators? Unable to affect pay, commanders offered other solutions. First, several commanders used training opportunities. Whether budgeted in small doses over an administrator's enlistment or used as an incentive at reenlistment time,[22] this carrot and stick approach proved successful. Another commander worked to guarantee that system administrators wouldn't have to perform the less glamorous jobs in the career field.[23]

Supported Unit Perspectives

Part of this research analysis includes an operations perspective to the possible retention problem of system administrators. The operators (units supported by computer networks) bring this critical function to the tip of the spear as the communications SAs support the Air Force's motto to "fly, fight, and win." While the data has the potential to be skewed due to limited responses, the information obtained from the respondents appears to be consistent. Each respondent agreed that the main role of the communications squadron is to provide responsive, reliable, and uninterrupted telecommunications services for the entire base and connectivity to off base units. When the operators were asked how important the C4I base network was to their operations, all responded with either "very important or critical" because they felt the Air Force had become increasingly dependent on computers to meet their mission requirements.[24] This dependency ranges from mission planning systems to training systems to day-to-day communications via e-mail, to staffing packages and tracking information. Then to further challenge the communications squadron, the operators expect to have the same capabilities when

they deploy as they do when they are in garrison. The operators expect to train the same way they fight; therefore, the systems must be available and working.

Another aspect of the interview was to gain a perspective on whom should ultimately be responsible for the operations and maintenance of the network infrastructure. Each respondent agreed that contracted services were needed; but they did not think the career field should be contracted out in its entirety. It was also suggested that SA functions and support be contracted out at non-contingency locations and for squadron level support. It was suggested that a small blue suit cadre be maintained at certain locations and at the wing level—for instance, at the network control center, the hub of the base network. One respondent indicated that it has become exceedingly difficult to get responsive service at home base because the enlisted force has been stretched fairly thin and also because it has been difficult to retain the higher qualified SAs once they were trained.[25]

The final area of the interview dealt with the perceived retention problem. The respondents were asked, "Retention of this career field is perceived as a problem, from your perspective what can we as military leaders do to keep these troops in?" There was a range of options provided, but each respondent believed there was a retention problem for the SAs. It was suggested that leaders appeal to a sense of patriotism. The respondents believed that only a very small percentage of the troops will respond to this. Another way is to increase their active duty service commitment to 6-10 years right up front, or simply to pay them what they are worth. In other words, to provide pay and benefits comparable to what their private sector counterparts are making. Some argue that this would never happen and simply contract out the work. The bottom line, which is consistent across the responses of the individuals interviewed, is computer networks are critically important to their operations, but the Air Force cannot compete with the

outside salaries or work schedules.[26] Low pay, rotating shifts with no monetary compensation, and constant deployments make the Air Force SAs' world much less attractive that the civilian sector. Further, to provide continuity and a consistent level of technical expertise, contracted services may be the right avenue of approach.

System Administrator Perspectives

A total of 30 administrators responded to the interview from both CONUS bases and overseas (see Table 7). The respondents averaged about 10 years in service, with average system administrator experience of 2.8 years. (Note: There was a high of 12 years experience and a low of no experience.)

Table 7. System Administrator Interview Demographics

AFSC		Rank		Gender	
3C0X1	21	A1C	3	Male	26
3C2X1	4	SrA	10	Female	4
3A2X1	2	SSgt	8	**Enlistment Term**	
2A0X1	1	TSgt	7	First	8
2E3X1	1	MSgt	2	Second	11
1N0X1	1			Career	11

Source: Interview, January 1999

Almost all the SAs in the research managed networks using some combination of Microsoft NT and Windows 95/98 operating systems. About a half of the respondents also had management responsibilities with UNIX (Solaris, Linux, HP-UX, etc.) systems and a fifth worked with Novell servers. They administered both unclassified and classified networks (secret through top secret/SCI) supporting from several hundred to several thousand users.[27]

All the SAs interviewed were asked what attracted them to the Air Force–why did they join? The responses indicated a strong desire for experience, education, and training (see Figure 7).[28]
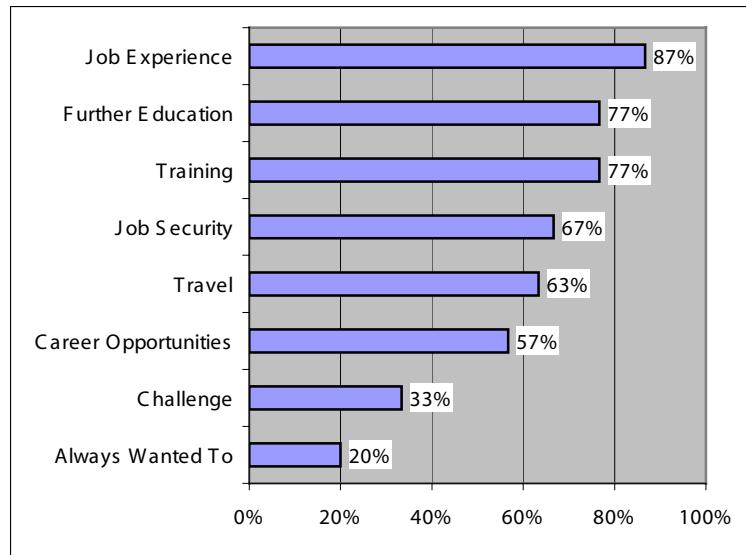
Figure 7. Why System Administrators Joined the Air Force

About 66 percent of the respondents indicated they were the best person (as opposed to civilians/contractors) to conduct system administrator duties in the Air Force. Although, several commented they saw positive benefits in having a mix of enlisted and civilian SAs for better training and continuity.[29]

General Satisfaction

The general satisfaction, of the system administrators interviewed, was high. When asked the bottom-line question, "Are you happy with your work?," 26 out of the 30 airmen interviewed responded "Yes." Of the 4 that answered "No": one cited the reason was due to high operations tempo; one cited frustration over the lack of training; one cited the overly administrative nature of his job versus the technical aspects he enjoyed more; and the fourth was simply too close to retirement to care anymore.[30] When asked how satisfied they were with their work, 67 percent of SAs indicated they were satisfied to extremely satisfied with their work (see Figure 8).[31]
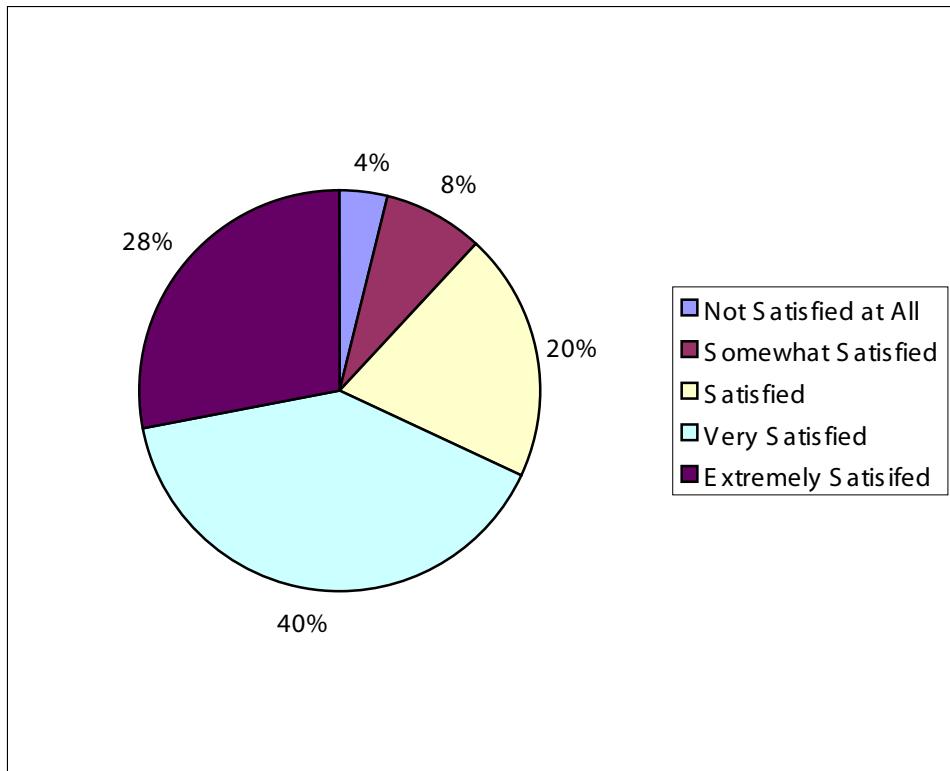
Figure 8. System Administrator Satisfaction

Many of the administrators that indicated they were satisfied, very satisfied, or extremely satisfied with their work commented their satisfaction could be increased with higher pay, recognition and/or training. The general level of satisfaction of Air Force SAs shown in Figure 8 compares well with the satisfaction levels of their civilian counterparts where 84.8 percent were moderately to very satisfied with their job (see Figure 9).[32]
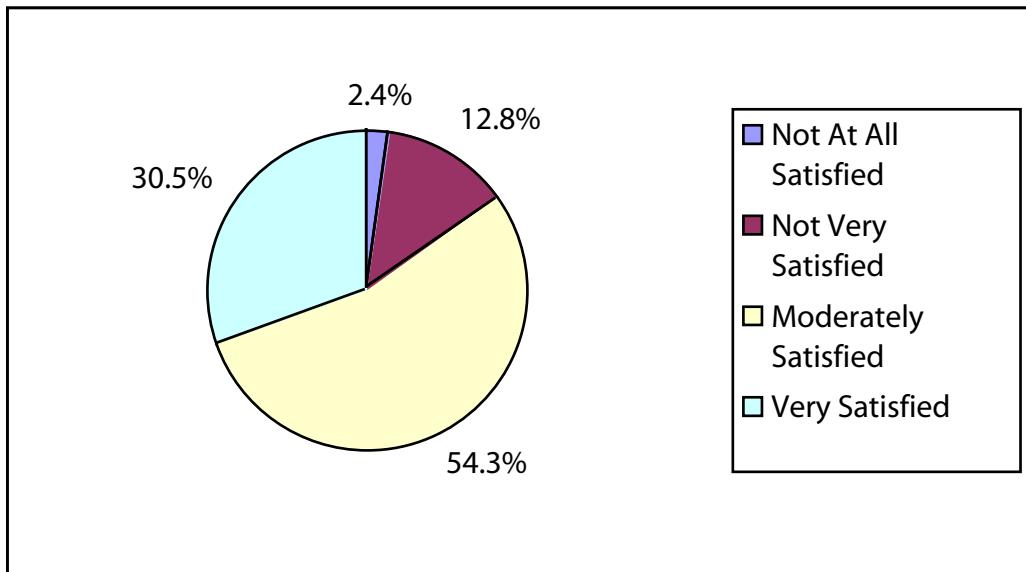
Figure 9. Civilian Network/IS Manager Job Satisfaction

Why Are They Leaving?

Of the 30 system administrators interviewed, only 5 indicated they were going to reenlist (see Table 8). Four were second term or career airmen with 10 or more years of service and were staying in until retirement. The one first term airman that responded she was going to reenlist wanted to continue her education, then leave the Air Force for a higher paying civilian job. Six of 7 career airmen were staying in the service until retirement. No NCOs indicated they were staying past the 20 year retirement point. One of the undecided second term airmen commented she might reenlist again if the SRB stayed the same or increased. Another indicated he would stay if he could stay at his present base until retirement.[33]

Table 8. Reenlistment Decision by Term

Reenlistment Decision	First Term Airmen	Second Term Airmen	Career Airmen
Yes	1	2	2
No	5	5	7
Doubtful	1	0	0
Undecided	1	4	2

Source: Interview, January 1999.

If these system administrators are mostly satisfied with their work, why are they leaving? Eighty percent of the SAs interviewed indicated they were not adequately compensated for their work. Only one first term airmen said she was paid enough. All administrators interviewed except 3 indicated they had considered leaving the Air Force to work for a private company. Two that answered "no" were both senior NCOs that were staying in until retirement, and the third was the first term airman staying in for another hitch.[34] Other than strictly pay, civilian employment was attractive to enlisted administrators because they felt they would get compensated (pay and benefits) commensurately with their skills and overtime, they would receive better training, have less extraneous (non-technical) duties, and receive more competent technical leadership.[35]

The dissatisfaction with pay for Air Force SAs is almost twice that for civilian network and IS managers. A survey of civilian network managers indicated 44 percent did not feel their total compensation was fair, while 44 percent did feel their compensation was fair and 12 percent were unsure. The mean salary of those respondents that felt their compensation was fair was $65,630 and the average for those who didn't feel it was fair was $54,130.[36] Both these average compensations are well above what the enlisted SAs interviewed for this research project earn.

Questions were asked to better define the reasons these SAs would consider separating from the Air Force (see Figure 10). Again, low pay was the strongest reason cited, but interestingly

only 13 percent considered leaving the Air Force over the length of the duty day. This is significant considering the average SA interviewed worked a 47.3-hour week. Several SAs also commented that too many career fields were being merged together, forcing them to stay proficient in knowledge and skills not used in their day-to-day duties.[37]
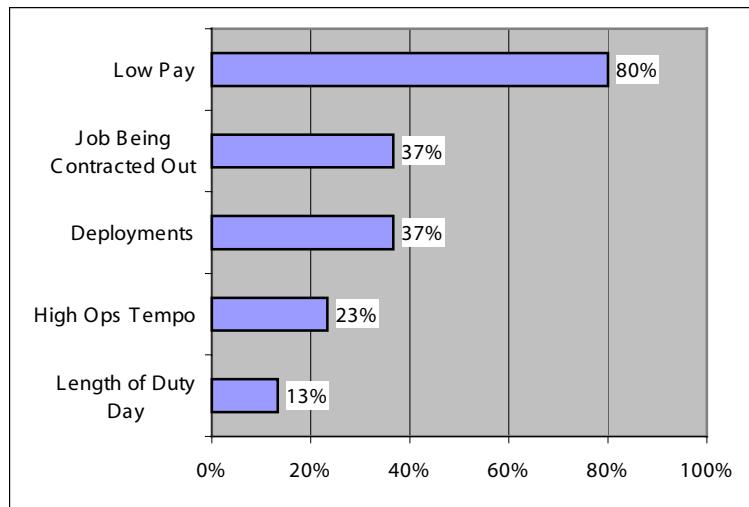
Figure 10. Why System Administrators Consider Leaving the Air Force

Some of the reasons Air Force SAs consider leaving the service are similar to some of the factors their civilian counterparts are dissatisfied with their jobs (see Figure 11).[38] Again, the strongest dissatisfaction factor among civilian IS workers is pay, at about 21 percent; not nearly as strong as the pay dissatisfaction of Air Force SAs. The hours the civilian IS worker puts into the job does not appear to be a strong dissatisfaction factor (only about 8 percent, see Figure 11), similar to the 13 percent of Air Force SAs (see Figure 10) that indicated the length of the duty day would influence them to leave the service.
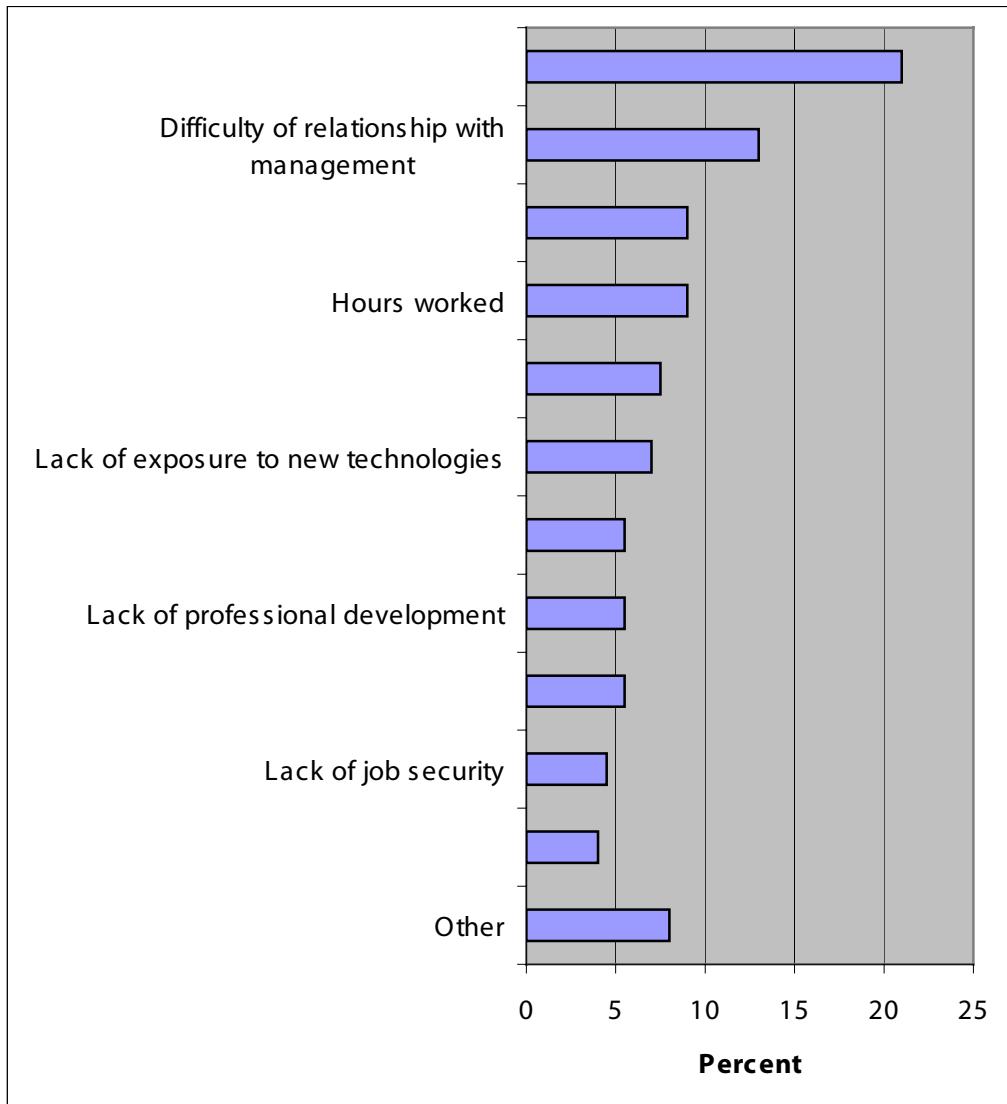
Figure 11. Civilian Network/IS Manager Job Dissatisfaction Factors

When asked what in general had changed in the Air Force--from their point of view what problems did they see in the Air Force; responses indicated a perceived problem in manpower, respect, and support to the enlisted personnel.[39] About a third of the administrators interviewed commented the lack of manpower was a problem in their unit. This lack of manpower made it difficult to keep up with the workload, keep up with training (their own training and training new airmen), and was generally driving down morale with the "do more with less" attitude it

conveyed. This frustration resulting from the lack of manpower was elaborated well by one staff

sergeant when he said,

> I am frustrated with the training I am provided. I am expected to train myself in what I need to know. I know of no other career field that sets their new people in front of their job, then tells them to learn it, and then walks away. It's not the people I work with or my supervisor either. There just isn't enough time in the day to keep this size network running and thoroughly train a person with the manning that we have. I'm expected to troubleshoot a multi-million dollar network with one SNS class two years ago and two 4 day Microsoft classes. The individuals who are the most knowledgeable, work 100 hour weeks. I could do that also, but I would be sacrificing my home life. These are my choices: work 14 hour days and never see home or work normal hours and be frustrated and incompetent at my job.[40]

A perceived lack of respect and support was cited by 27 percent of the respondents. These

airmen and NCOs commented on the lack of professionalism and respect between and among

enlisted and officers alike. Civilians showed a similar dissatisfaction with the relationship to

management (13 percent) in Figure 11.[41] Several NCOs also commented they were given

responsibilities without commensurate authority or freedom of action to meet those

responsibilities. Several other SAs interviewed (8 out of 30) commented the perceived erosion

of benefits (retirement, family medical care, base services, etc.) was a problem they saw growing

with the Air Force.[42]

Why Would They Stay?

With the issues of pay versus benefits being a hot topic of discussion within the military, the

survey asked the system administrators what they valued more–the pay or the benefits. Pay was

nearly twice as important to the respondents with 50 percent indicating pay was more important

to them, 23 percent responded the benefits were more important, 17 percent indicated both were

important, and two said neither were important to their career decisions (both of these

respondents were within 4 years of retirement). Several of the administrators that commented

that the military benefits would *influence* them to reenlist also indicated that the benefits were not enough or had degraded too much for them to actually go ahead and *commit* to reenlistment. Also, several SAs commented that they perceived benefits offered by civilian employers were superior or at least equal to Air Force benefits.[43]   This is consistent with the information presented in Chapter 3, Reenlistment Bonuses, that civilian employment benefits and bonuses may be outstripping the appeal of Air Force benefits and SRBs.

All SAs interviewed were also asked what would influence them to make the Air Force a career. Other than pay, the strongest influence cited was training, followed by more promotion opportunities and higher SRBs (see Figure 12).[44] For first term airmen, 100 percent indicated more training would influence them to stay in the Air Force.[45]
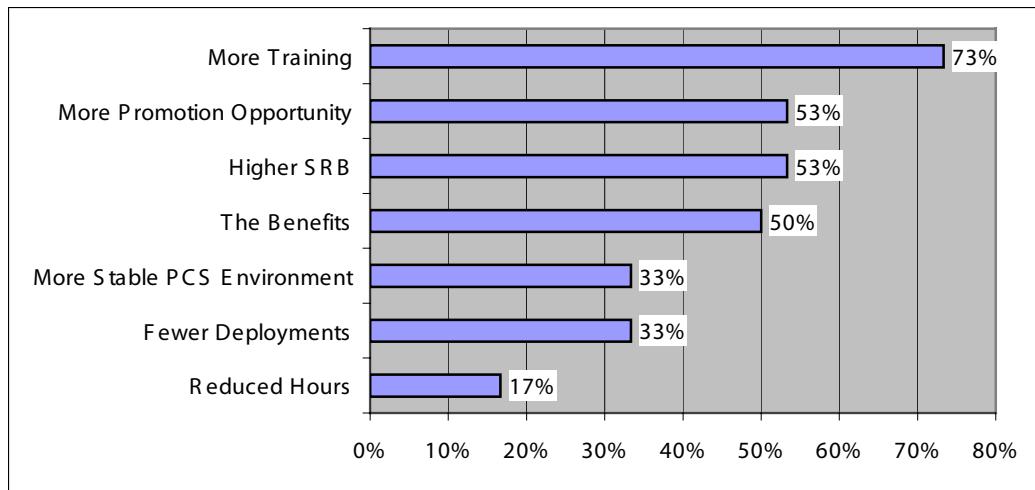
Figure 12. What Would Influence System Administrators to Stay in the Air Force

Training

The interview process indicated a general dissatisfaction with training. Only three of the SAs interviewed attended the core SA course conducted at Keesler Air Force Base. Respondents indicated the majority of their training was conducted on-the-job (OJT) in conjunction with formal courses given by commercial schools and computer based training (CBT). Over 70

percent of the administrators interviewed attended commercial courses paid for by the Air Force. The majority of these courses were for various Microsoft administrator courses. Only 3 administrators interviewed had obtained industry certified credentials and 3 were working on their certification. About 40 percent of the SAs had completed at least one CBT course with several completing over 5 CBT courses.[46]

When asked to rate how well their initial technical training prepared them for their duties, those interviewed responded this training was just satisfactory. They rated (on average) the training they received since their initial training as slightly better than satisfactory in preparing them for their duties.[47] Three of eight first term airmen interviewed rated their initial training as satisfactory or very satisfactory; the remaining first term airmen rated their initial Air Force training as not satisfactory to prepare them for their duties. They all indicated they relied mostly on OJT and self-learning to do their jobs.[48]

Although the majority of SAs indicated the training they received was sufficient to accomplish their jobs, the frustration seemed to be in the pressure to get and apply the training (especially formal training). Many administrators cited the need to "learn as you go"; having to learn a new piece of hardware and software while installing it and making it operational. The rapid change in technology made it difficult to keep up with, let alone ahead of, the need for training. Several mid-grade NCOs commented on the pressure to do both their job and train new airmen fresh out of initial training. Adding to this pressure was the need to meet deployment requirements--often having to deploy the most experienced personnel and adding to the workload of the remaining experienced administrators to both keep the network operational and train new personnel.[49]

This chapter has shown there is a retention problem for system administrators within the United States Air Force and explored the retention issues from leadership and enlisted SA perspectives. This analysis would not be complete without a comparison to similar issues within the civilian industry.

Notes

[1] Briefing, Air Force Communications Agency, subject: Quarterly Career Field Health Update, 15 May 1998, available from http://www.afca.scott.af.mil/3c.

[2] Ibid. The red stoplight criteria for retention is for one category (first term, second term, or career) to be greater than 15 percent below the Air Force Goal. The 1998 second term retention of 56 percent is 19 percent below the Air Force goal of 75 percent. The yellow stoplight criteria for sustainment is for the projected FY03 manning of at least one rank to be below the sustainment goal for that rank. The E1-3 FY03 projected manning of 965 is below the sustainment goal of 1688.

[3] Paul Helphenstine, "Consider all Options to Keep Enlisteds," *Air Force Times*, vol. 58 issue 32 (16 March 1998): 1.

[4] Briefing, Air Force Communications Agency, subject: 3C Career Field, October 1998, available from http://www.afca.scott.af.mil/3c. This briefing indicated the caution light for 3C0X1 manning would go on if overall manning went below 90 percent. Manning in October was 92 percent. Statistics for the career field released in December 1998 put the manning at 88 percent.

[5] MSgt Mark Behrle, "3CXXX Manning Statistics," 31 December 1998, available from http://www.afca.scott.af.mil/3c.

[6] Briefing, Air Force Communications Agency, subject: 3CXXX Manning Statistics, January 1999, available from http://www.afca.scott.af.mil/3c/manning.html.

[7] Terry Stevens, "Provide more Guidance to Enlisteds," *Air Force Times*, vol. 58 issue 24 (19 January 1998): 29.

[8] White Paper on Operationalizating and Professionalizing the Help Desk, prepared by Air Force Communications Agency, 25 January 1999, available from http:/www.afca.af.mil/optn.

[9] Interview, January 1999.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] Ibid.

[15] Ibid.

[16] Ibid.

[17] Ibid.

[18] Ibid.

[19] Ibid.

[20] Ibid.

[21] Ibid.

Notes

[22] Ibid.

[23] Ibid.

[24] Ibid.

[25] Ibid.

[26] Ibid.

[27] Ibid.

[28] Ibid.

[29] Ibid.

[30] Ibid.

[31] Ibid.

[32] Bob Vivlino, "Third Annual Network/IS Managers Salary & Job Satisfaction Survey," *Network Computing*, available from http://www.networkcomputing.com/903/903f2.html.

[33] Interview, January 1999.

[34] Ibid.

[35] Ibid.

[36] Bob Vivlino, "Third Annual Network/IS Managers Salary & Job Satisfaction Survey," *Network Computing*, available from http://www.networkcomputing.com/903/903f2.html.

[37] Interview, January 1999.

[38] Bob Vivlino, "Third Annual Network/IS Managers Salary & Job Satisfaction Survey," *Network Computing*, available from http://www.networkcomputing.com/903/903f2.html.

[39] Interview, January 1999.

[40] Ibid.

[41] Bob Vivlino, "Third Annual Network/IS Managers Salary & Job Satisfaction Survey," *Network Computing*, available from http://www.networkcomputing.com/903/903f2.html.

[42] Interview, January 1999.

[43] Ibid.

[44] Ibid.

[45] Ibid.

[46] Ibid.

[47] Ibid.

[48] Ibid.

[49] Ibid.

CHAPTER 5

Civilian Retention Discussion

I've been trying to adjust salaries to attract the types of people we need, but it's been very difficult. Just today, I had one employee resign. He was offered $14,000 increase plus a 4 percent bonus if he stayed a year.

—Mr. Bill Branch, CIO University of Central Florida

Civilian Retention Perspectives

The military, specifically the information technology arena, is experiencing retention problems. In order to gain insight into retention issues and challenges, the examination of the private sector can be useful. Today's unprecedented demand for skilled information technology (IT) professionals means virtually unlimited job opportunities for these individuals.[1] With an estimated one in ten IT positions vacant, according to some projections, organizations are offering incentives and rewards to lure and retain good technical talent.[2] Amid this increased demand, managers are becoming more and more sensitive to the issue of employee retention.[3]

The employment trend for state government IS workers can be summed up in two words: "I quit."[4] States are losing key information systems employees to higher paying jobs at private companies at accelerating rates and the state's loss is an outsourcer's gain according to several state officials.[5] In fact, a skills survey found that nearly all IS skills now command a salary premium, some over 30 percent.[6]

In a survey of 240 companies, money was obviously an important component in any retention effort but the senior staff at Sears, Roebuck and Co. and Xerox argued that it isn't the number one ingredient for success. Their approach centers on working conditions, skills development, career advancements, and profit sharing and bonuses.[7] However, many IT managers are offering bonuses to convince a job candidate to sign on because competition to fill open positions is so high.[8]

So is money the most important factor? According to several human resources managers, with low staffing, high stress, and long hours, the number one requested benefit has become time off (assuming pay is competitive with the industry standard in the first place).[9] Exacerbating this change in attitude is the industry's over demand for information technology professionals and the increased demand for IT projects.[10] Results from a study by researchers at Drexel and Rider Universities show that IT professionals tend to rate career development and non-monetary compensation as more important factors in job satisfaction than money.[11] A *Computer World* survey of 500 IT professionals yielded similar results.[12] Yet another *Computer World* survey of 200 IT professionals found money wasn't the most important factor in deciding whether to jump ship.[13] In fact, the survey revealed that having the opportunity to learn new technologies and having a good boss were more important.[14] The quality of the bosses was a top-ranking issue for almost eight out of 10 of those surveyed. Qualities of a good boss included being fair, flexible, and knowledgeable.[15] Interestingly, problems with the boss are a major cause of dissatisfaction in the IT world and is the primary reason for leaving according to the Vice President at Blessing/White, Inc.[16] Another point brought out in the survey is that IT employees also tended to stick with bosses who had stuck by them in times of family difficulties.[17] A survey of 98 members of the Society for Information Management revealed that one of the main things IT

professionals seek in an employer is a sense of community.[18]

What else might be influencing IT retention?   The *Computer World* annual job satisfaction survey indicated that IT professionals routinely say they are under appreciated, overworked, and overstressed.   Based on that, they want more money and benefits, or they'll find more appreciation, better pay, and less stress elsewhere.[19] In fact, one company president cited two decades of corporate downsizing as the primary culprit in the IT retention battle. Employers are less loyal and the employees know it.[20]

Civilian IT Retention Solutions

With competition for qualified IT professionals at record levels, what are these companies doing to combat the retention issues they are experiencing? Nationwide, almost 7 out of 10 managers are increasing starting salaries and according to the *Computer World's* annual salary survey, the average salary increase is nine percent—more than twice the national average for other professions.[21] As for training, 39 percent of the respondents to *Computer World's* hiring survey use training to combat IT staff turnover.[22] With regard to the intangible techniques, some companies are enhancing the department culture and building morale and productivity to foster a positive corporate environment through fostering creativity, recognition, a spirit of teamwork, bringing outside help to supplement their efforts (outsourcing) and offering "perks."[23] Companies are offering enticements such as extra personal time, flexible work hours and compressed work weeks, compensatory time, telecommuting, training, mentoring programs, and stability and security from downsizing.   Other tools being used include regular praise and recognition and a relaxed office environment.[24]

This same philosophy was echoed at Kraft Foods, Inc., where annual IT turnover rate was knocked down to a stunning five percent from ten percent—the IT folks at Kraft say the top reason they stay is the sense of family.[25]

Lastly, HayGroup conducted an IT retention survey designed to identify the key drivers of retention for IT professionals. Five areas were identified to drive turnover: (1) career opportunity, (2) enjoyment of work, (3) reward, (4) leadership, and (5) technology. HayGroup also identified several best practices which led to reduced turnover: (1) dramatically improving career opportunities, such as implementing career ladders and development plans and ensuring access to new technologies; (2) ensuring job satisfaction, including the individual's "fit" with the job; and (3) staying on top of the IT compensation market.[26]

Notes

[1] Greg Scileppi, "Ramping up your IT Retention," *Computer World*, 20 January 1998, available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

[2] Tim Walsh, "Time to go?" *Computer World*, available from http://www/computerworld.com/home/features.nsf/all/980316leave.

[3] Greg Scileppi, "Ramping up your IT Retention," *Computer World*, 20 January 1998, available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

[4] Patrick Thibodeau, "State IS Workers Seek Greener Pastures," *Computer World*, 17 March 1997, available from http://www.computerworld.com/home/print9497.nsf/all/SL11states.

[5] Ibid.

[6] Miryam Williamson, "Paying Through the Nose," *Computer World*, 24 November 1997, available from http://www.computerworld.com/home/online9697.nsf/all/971124skills.

[7] Alan Earls, "Retention Getters," *Computer World*, available from http://www.computerworld.com/home/online9697.nsf/all/980209retention.

[8] Christopher Velissaris and Nancy Vercauteren, "Sizing up sign on bonuses," *Computer World*, 12 May 1998, available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

[9] Mary Brandel, "Get me Out of Here," *Computer World*, available from http://www.computerworld.com/home/print.nsf/all/9902158FB2.

[10] Ibid.

[11] Barb Cole-Gomolski, "Techies want more than pay," *Computer World*, available from http://www.computerworld.com/home/print.nsf/all/98062953C2.

[12] Ibid.

[13] Robert Scheier, "IS money can't buy Happiness," *Computer World*, 24 February 1997, available from http://www.computerworld.com/home/print9497.nsf/all/SL0224rs.

Notes

[14] Ibid.

[15] Ibid.

[16] Tim Walsh, "Time to go?" *Computer World*, available from http://www/computerworld.com/home/features.nsf/all/980316leave.

[17] Ibid.

[18] Tom Hoffman, "CIOs Share Retention Tips," *Computer World*, available from http://www.computerworld.com/home/print.nsf/all/981102739A.

[19] Alan Earls, "Retention Getters," *Computer World*, available from http://www.computerworld.com/home/online9697.nsf/all/980209retention.

[20] Ibid.

[21] Natalie Engler. "Jobs Forecast '98: Desperate Measures," *Computer World*, available from http://www.computerworld.com/home/print9497.nsf/all/SL52crjobs1773A.

[22] Ibid.

[23] Greg Scileppi. "Ramping up your IT Retention," *Computer World*, January 20, 1998, available from http:/www.computerworld.com/home/online9697.nsf/all/980120careers.

[24] Ibid.

[25] Kathleen Melymuka, "Kraft's 5% Solution," *Computer World*, available from http://www.computerworld.com/home/print.nsf/all/981102725A.

[26] Linda Pittenger. "Creative Solutions for Attracting and Retaining Key IS Personnel," 29 April 1998, available from http://www.coba.unt.edu/isrc/9798prog/apr-syn.htm.

Chapter 6

Conclusions

People say a lot of things about our troops—how valuable they are. If you believe that ... pay them what they're worth.

—Secretary Rodney Coleman, SAF/MI

There is a retention problem in the Air Force across the enlisted force; but more specifically, the lack of trained, skilled, and knowledgeable enlisted SAs in the Air Force is a problem. Official statistics on manning levels for the 3C0X1 field show a decline in assigned levels to the present 88 percent of authorized manning.[1] Interviews with communications unit commanders indicate a high turnover rate of enlisted SAs and an inability to fill all authorized billets. The mission of operating and maintaining the networks gets done, but at the cost of overtime and increased stress on the troops.[2] Enlisted SAs agree there are not enough people (enlisted, civilian, or contract personnel) with the required skills to meet the present workload.[3]

Summary of Findings

The crux of the exodus (which is synonymous with retention) is due to pay, benefits, training, and being overworked. The number one gripe highlighted in the system administrator interviews was pay. Air Force SAs know what their skills are worth and know the civilian sector will pay them two, three, or more, times their present basic pay to leave the Air Force for the civilian workplace. Obviously, pay is not what primarily influenced them to join the Air Force

in the first place. Rather, most joined to get an education, training, and job experience in computer network technology. They appreciate the sense of family, exposure to new technologies, and benefits (both tangible and intangible) of Air Force life; but they also perceive a decline in the value of those benefits. The training they do receive is mostly OJT, self-taught, and done on their own time. Air Force SAs are loyal, hard working, and willing to put in the extra time and effort to accomplish the mission; but most are frustrated with the workload, lack of training, and perceived lack of support from their leadership.[4]

The commanders interviewed for this research project recognize most of these problems. They realize that many SAs joined the Air Force to get an education and experience they could use to obtain a better career in the civilian sector. Once those objectives are met and their initial enlistment's are up, they leave; and there isn't much commanders or the Air Force can do to change their minds. For those troops that consider staying in the Air Force, commander's appeal to their patriotism, desire for stability or adventure, love of technology, and pursuit of new skills and knowledge. Most commanders indicated that training was a key issue and budgeted as much money as possible for formal training, encouraged OJT and use of CBTs, as well as setting aside equipment for training labs. Unfortunately, workload and lack of trained mid-grade and senior NCOs (due to unfilled billets and/or temporary duty) often hindered training of new troops.[5]

These problems are not unique to the military, they're also evident in the civilian sector. Pay is still a primary gripe of civilian network professionals. The main difference here is that the civilians are making an average of two to three times the basic pay of Air Force system administrators for similar duties. They are also often paid a premium for high-demand skills such as intranet/web development, network connectivity, and database management.[6] They have the flexibility of moving to another company at a time of their choosing; often pocketing a

lucrative signing bonus along with increased salaries. Their basic need of financial security is fulfilled. The other strong motivating factors to leave (or stay) are training, good corporate communications, being part of the team or corporate community, working with cutting edge technology, and proper leadership support.[7,8,9]

Implications

The retention trend has a negative feedback effect on the Air Force. The Air Force loses highly trained personnel who are replaced eventually with younger, minimally skilled troops. Further, critical positions are filled with less experienced administrators with a very limited ability to maintain and operate the network.[10] The few remaining skilled NCOs are stretched thin between tackling the more difficult network problems, training new troops, training themselves, accomplishing routine management and additional duties; and fulfilling deployment requirements.[11] Contributing factors include lower manning levels, rapidly changing technologies (that users want now), and minimal funding for formal training. The new troops are often forced to learn these new systems on the fly—on their own. Although, the results are often mission success and satisfactorily trained SAs; it also results in frustration, burn-out, and decreased morale.[12]

Unfortunately, pay and benefits are not in the direct control of our senior leaders, but they continue to address these issues at the Secretary of Air Force and legislative levels. One point to note is that leadership at all levels does have a direct influence on the troops. The commanders and senior leaders must remove obstacles, share vision, enhance school development, and provide family time. If this is done then the Air Force will improve its appeal to the patriotism and security of Air Force life. The Air Force will almost certainly never offer competitive pay like the civilian IT workplace. For those enlisted personnel where pay is the primary issue, the

Air Force will almost always lose. For the rest, the research suggests that the impact to retention is training, leadership, and quality of life issues.[13]

Recommendations

Top Air Force officials conceded that there are no simple solutions for halting the escalating exodus of airmen and express frustration with their inability to affect the trends that are undermining readiness and retention.[14] The communications unit commander and system administrator interview results previously discussed identify several areas of dissatisfaction and the underlying causes. Analysis of these results in conjunction with similar research results from the civilian sectors suggests some courses of action the Air Force can take to improve retention.

Air Force System Administrator Retention Solutions

Despite aggressive efforts to reverse declining retention rates top Air Force officials do not expect improvements any time soon and concede that there are no simple solutions for halting the escalating exodus of airmen.[15] Based on this research the following measures may be taken to improve retention and provide positive incentives to stay in the Air Force:

1. Training – SAs are hungry for training and unit commanders should endeavor to provide it any way possible. Training improvement opportunities include:

    a. Allocate more funds for formal training. Target this funding for training on new technologies that aren't currently covered by Air Force technical schools or CBTs. Use formal training as an incentive to top troops to reenlist.

    b. Make civilian/contractors responsible for OJT. Put this responsibility in their job descriptions or contracts. Require them to have vendor specific training certification. Civilians should provide continuity in the work center, thereby shifting the technical training burden off the mid-grade NCOs and free them to do their technical and leadership duties.

    c. Establish a mentoring program. This should be a personal relationship and not just a checklist. New SAs should have a clear idea of their career progression, both technical and professional. Although the mentor may not be directly responsible for

training the new airman, he should work with the airman to make sure the training gets done.

d. Establish a training lab. Set up a small, off-line network where SAs can do their CBTs and experiment with new software and hardware. This will give them the freedom to learn and apply new technology and reduce the adverse risk to the active network.

2. Efficient use of technology – there are reasonably priced network management applications that can reduce the workload on SAs. If properly planned, implemented, and operated these applications can enable thinly manned network control centers to effectively manage thousands of workstations.

3. Leadership – provide the young airmen with competent and enthusiastic leadership. If the NCOs running the work centers are not technically competent or excited about their work, the new troops pick up on this quickly and are discouraged, often to the point of leaving the Air Force. Ensure the NCOs in leadership positions have both clearly defined responsibility and authority to do their jobs.

a. Build a team. Communicate to the SAs what their role is in the overall mission. Listen to their ideas and encourage them to implement their ideas if they sound good. Listen to their needs, even if you can't satisfy them all, your concern will make them feel they are important.

b. Recognition. Make sure accomplishments and hard work are rewarded, if only a public pat on the back or letter of appreciation.

c. One-on-one management. Retention is often worked on an individual basis. Sometimes keeping someone in is as simple as moving them to a different project, because they are personally interested in that technology or working with a different team.[16]

Some longer-term suggestions that would have to be addressed at the DoD or Air Force level are:

1. Impose longer enlistment and/or service commitments following both Air Force and vender specific commercial training. Training that significantly improves an airman's marketability in the civilian sector should require more of a commitment to Air Force service.

2. Train communications officers and NCOs in retention issues and solutions. Neither the Basic Communications Officer Training (BCOT) nor Advanced Communications Officer Training (ACOT) courses address SA retention.[17] Research on retention of civilian IT workers indicates that first line managers have tremendous influence on the worker's decision to stay with the company.[18]

3. The AF should conduct annual surveys of SAs similar to the way the civilian sector does to gauge the concerns and satisfaction of the workforce. These results could be used by

the functional managers and commanders and used at ACOT/BCOT to educate our leadership on the problems and potential solutions to the retention issue.

4. Define critical SA skills and offer bonus pay to airman with skills in critical jobs. Civilian industry already offers salary premiums for IT workers with critical skills.[19] The Air Force already offers special pay to airmen with critical linguist skills, skills that took a great deal of time, effort and study to develop. Perhaps the Air Force should offer special pay to SAs that have made the effort to attain critical technical skills such as intranet/web site development, network connectivity, database management, etc.

5. Continue to pursue quality of life programs. If the Air Force continues to expect SAs to "do more with less" (to the airman this usually means more hours with no more pay), then the Air Force must provide other positive incentives such as better quarters, messing, health care, and retirement benefits.

Suggestions for Future Research

Retention in the civilian IT industry is managed at the office level. Retention issues and fix strategies should be taught to our field leadership. Surveys similar to those used in the civilian sector should be developed and administered annually to provide the basis of a field level retention strategy that can be implemented in the Air Force. This survey should be developed, preferably using web and database technology to ease the collection and analysis of data. Once the data is collected and analyzed, course material should be developed that informs our field-level leadership of the depth and complexity of the retention issue and presents a strategy that can be implemented at the field level that will encourage the maximum number of Air Force SAs to reenlist.

Some civilian managers consider getting their SAs to stay one or two years beyond the industry norm a retention success. Are we asking our Air Force SAs to make too great of a commitment to reenlist for four to six years? Would we have better results if we let them stay in for one or two years at a time? Or work their commitments like officers: after the initial commitment is over, serve until they want to separate, are asked to get out, or serve out

50

additional commitments incurred from training, promotion, moving, etc.? This is a potential strategy that should be explored in future surveys of the enlisted SA force.

This research showed training to be a major issue of concern to enlisted SAs. Future research should look at this issue in more detail. Some suggested questions are: How much do SAs mind doing self-paced training on their own time? How effective do they find CBT courses to accomplishing their jobs? Do they feel CBTs are adequate training instead of formal training? How satisfactory is the OJT they receive from senior personnel in their unit?

In conclusion, the Air Force does have a system administrator retention problem. This is evident through future Air Force end-strength and manning projections and supported by the field interviews. Today with all the different "retaining" techniques being used, it's almost playing the lottery to see which one will really work and endure the test of time.[20] The Air Force along with the civilian sector, will not be able to retain 100 percent of their employees; however, creating a great place to work can mitigate the factors encouraging employees to leave while enhancing the properties that encourage employees to stay.[21] The bottom line is that whatever retaining techniques are employed, they are an investment for the Air Force's future; unfortunately, the people are caught in the middle.

Notes

[1] MSgt Mark Behrle, "*3CXXX Manning Statistics,*" 31 December 1998, available from http://www.afca.scott.af.mil/3c.
[2] Interview, January 1999.
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] Miryam Williamson, "Annual Skills Survey," *Computer World*, 24 November 1997, available from http:/www.computerworld.com/home/online9697.nsf/all/971124skills.
[7] Greg Scileppi, "Ramping up your IT Retention," *Computer World*, 20 January 1998, available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.
[8] Alan Earls, "Retention Getters," *Computer World*, available from http://www.computerworld.com/home/online9697.nsf/all/980209retention.

Notes

[9] Robert Scheier, "IS money can't buy Happiness," *Computer World*, 24 February 1997, available from http://www.computerworld.com/home/print9497.nsf/all/SL0224rs.

[10] Interview, January 1999.

[11] Ibid.

[12] Ibid.

[13] Ibid.

[14] John Pulley. "Running on Empty," *Air Force Times*, vol.58, issue 32 (16 March 1998): 3.

[15] Ibid.

[16] Alan R. Earls, "Retention Getters," *Computer World*, available from http://www.computerworld.com/home/online9697.nsf/all/980209retention.

[17] Mr. Whittmer, 333 TRS Curriculum Development, telephone conversation, 2 March 1999.

[18] Robert Scheier, "IS money can't buy Happiness," *Computer World*, 24 February 1997, available from http://www.computerworld.com/home/print9497.nsf/all/SL0224rs.

[19] Miryam Williamson, "Annual Skills Survey," *Computer World*, 24 November 1997, available from http://www.computerworld.com/home/online9697.nsf/all/971124skills.

[20] Christopher Velissaris and Nancy Vercauteren, "Sizing up sign on bonuses," *Computer World*, 12 May 1998, available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

[21] "Employee Retention in Information Technology the solutions," available from http://contentedcows.com/IT_employee_retention.htm.

Appendix A

System Administrator Interview Questions

Part I: Background Data

1. Name:

2. Unit:

3. Phone number:

4. E-mail:

5. What is your gender?

6. Your age?

7. What is your rank?

8. What is your AFSC?

9. How long have you been in the Air Force?

10. How much longer do you have in the Air Force?

11. Do you intend to reenlist when that time comes?

Part II: System Administrators/NCC Operators

1. How many years of system administrator experience do you have?

2. Have you attended the core system administrator school at Keesler AFB?

3. What commercial courses have you attended? (e.g., Novell, MS Certified Engineer or related)?

4. On average, how many hours do you spend on the job each week?

5. How much time to you spend studying for upgrade training? (e.g., 3,5, or 7-level)?

6. How many of the Computer Based Training packages now available have you completed?

7. Are you happy with your work?

8. What operating system(s) support your operations (Windows, NT, UNIX, Solaris, etc.)?

9. What are the primary applications that support your operations (e-mail, Office, etc.)?

10. Do you feel you're adequately compensated for your work? (pay, benefits)?

11. If a first term airman, do you intend to make the Air Force a career?

    If no, why?

12. If a second term (or more) airman/NCO, do you intend to remain through retirement?

13. Have you considered separating from the Air Force to work for a private company?

14. What would cause you to separate (answer all that apply):

    Low pay by the Air Force vs higher pay in industry?

    The length of the duty day?

    To reduce the operations tempo?

    To eliminate the need to deploy (e.g., 120 day deployments to an overseas AOR)

    Elimination of your job due to contracting efforts?

    Other (explain)?

15. What will cause you to make the Air Force a career (answer all that apply)?

    Higher selective reenlistment bonus?

    Reduced hours?

More training?

Fewer deployments?

More promotion opportunity?

The benefits?

More stable PCS environment (e.g., ability to remain in one location)?

Other (explain)?

16. Which do you value more, the pay or benefits? (e.g., is being a member of the Air Force family with its benefits enough incentive to remain on active duty or will potential higher pay lead to a career change?)

17. Are you happy with your work?

18. How did you hear about the Air Force?

19. What was it about the Air Force that attracted you to it? In other words why did you join (answer all that apply)?

Further education?

Job experience?

Job security (benefits)?

Training?

Challenge/competition?

Career Opportunities?

Travel?

Always wanted to?

Nothing better to do?

Other:

20. Obviously, you are still in the military. Is your plan to stay? If so, for how long? If not, why?

21. What has changed in the Air Force? From your point of view, what problems do you see in the Air Force?

22. From your career perspective, what problems do you see?

23. Are the problems insurmountable? Why?

24. What do you see the civilian sector offering that draws you to it?

25. What are the good things about the Air Force?

26. What are the good things about your career field?

27. As a system administrator in the Air Force, what is your job?

28. Do you feel you are the best person to do this or should someone else do this type work for the Air Force?

29. What kind of training have you had?

30. Do you feel the training you have been given is sufficient to do your job?

31. If there is one thing that could make you stay in the Air Force, what would it be? Why?

32. How many years have you been a System Administrator?

33. How many networks do you have system administrator duties on?

34. What are the classification levels of these networks?

35. How many workstations are in the network(s) you administer?

36. How many users are on the network you administer?

37. What operating systems have you been trained on (NT, UNIX, Solaris, Banyan, etc.)?

38. Do you have any industry credentials (Microsoft, Sun, Banyan, Cisco, etc.)?

      If so, did you get them through the Air Force or on your own?

39. On average, how many hours per week to you work?

40. On average, how times per week do you get called into work when you are off-duty?

41. Do you plan on re-enlisting?

> If not, why?

> What, if anything, would influence you to stay in the Air Force?

42. Why did you want to be a System Administrator?

43. How satisfied are you as a System Administrator (1 – not satisfied at all, 2 – somewhat satisfied, 3 – satisfied, 4 – very satisfied, 5 – extremely satisfied)?

> What would improve your job satisfaction?

44. What would help you to do your job better?

45. How much training have you received from the Air Force since initial technical training school (differentiate between OJT, CBT, and formal training)?

46. How well do you think your initial technical training prepared you for your duties (1 – not well at all, 2 – satisfactory, 3 – very well)?

47. How well do you think training you have received since your initial training has prepared you for your duties (1 – not well at all, 2 – satisfactory, 3 – very well)?

48. How many TDY's (other than training) have you been on in the last 2 years, please indicate the duration of each TDY?

Appendix B

Commander Interview Questions

Part I: Background Data

1. Name:

2. Unit:

3. Phone:

4. E-mail:

5. What is your gender?

6. Your age?

7. What is your rank?

8. What is your AFSC?

9. How long have you been in the Air Force?

10. How much longer do you have in the Air Force?

Part II: Squadron Commander Perspective

1. You have a lot of diverse functions in a communications squadron, what do you see as your biggest challenge today? Why?

2. What is the role of the system administrator at your base?

3. Your 3COXXs, specifically, the system administrators, appear to be getting out of the Air Force at an alarming rate, do you see it that way? Why or why not?

4. As you speak to those who intend to get out, what are your discussions like?

5. For those that stay, what in your mind convinced them?

6. For those that decided to separate, why? Or in your mind, why do you think they left?

7. If retention really is not a problem, from your perspective, do you see a "disgruntled" work force in the system administrators? Why or why not?

8. Do you see this function as one that will stay primarily enlisted or do you see this function transitioning to civilians and contractors? Why or why not?

9. Could you make an argument that can support our enlisted force to continue to do these functions?

10. In your opinion, does the wing commander or support group commander understand the challenges of the system administrators?

11. Who at your base does this function other than 3C0XXs?

12. What is your ratio of system administrators to network users?

13. What do you feel is your core mission/function?

14. What do your customers (wing CC, unit CC) feel is the core mission?

15. Concerning manning, which AFSCs in your organization are most critically manned (e.g., number of vacant spaces versus number authorized)?

16. What percentage of your time/resources are committed to network operations and management?

17. What is your current turnover rate in 3C0 and 3C2 career fields?

18. How many billets (3CO and 3C2) are authorized for network management?

19. How many fills does MAJCOM provide?

20. Do you have adequate manning based on your perceived need versus approved manning levels?

21. What is the average rank and years of experience of your network administrators?

22. How have you incorporated Information Management personnel into your operations?

23. How much have you allotted in your O&M budget, to get outside/commercial training?

24. What kind of missions do your networks support (administrative, logistics, operations, intelligence, etc.)?

25. How many networks does your unit support?

    Number of workstations on each network?

    What is the classification level of each network?

    Operating systems supported on each network (Windows, NT, Solaris, Banyan, etc.)?

26. How is you network control center manned (24 x 7, day shift only, administrators on call)?

27. How often do you call in off-duty enlisted system administrators to meet mission needs?

28. Is enlisted system administrator retention a problem in your organization?

29. Do you feel you have enough system administrators (enlisted, civilian, and contractor) to meet the needs of your customers?

30. Do you think the Air Force needs enlisted system administrators; why?

31. Of the enlisted system administrators that have not reenlisted in your unit, why do you feel they left the Air Force?

32. What can be done to entice them to stay in the Air Force?

33. Is the initial technical training that system administrators receive sufficient for them to meet the needs of your unit?

34. What additional training do you provide them?

35. Do you feel there are enough system administrators in you organization to meet your network requirements?

36. Are enlisted system administrators (instead of civilian or contractor) necessary for your operations?

37. Does your unit have a deployed mission that requires network support? If yes, what is the size of your deployed network?

Appendix C

Operations Commander Interview Questions

Part I: Background Data

1. Name:

2. Unit:

3. Phone:

4. E-mail:

5. What is your gender?

6. Your age?

7. What is your rank?

8. What is your AFSC?

9. How long have you been in the Air Force?

10. How much longer do you have in the Air Force?

Part II: Operations Perspective

1. What do you see as the main role of the communications squadron?

2. As for system administrators, those folks that maintain your C4I base network, how would you rank that job in terms of importance to your operations (1 - not important at all, 2 - somewhat important, 3 - moderately important, 4 – very important, 5 – critically important)?

3. Would you say this is a critical function?

4. What about when deployed?

5. Do you think your enlisted force should continue to provide this support or do you believe someone else should do these duties?

6. Retention of this career field is perceived as a problem, from your perspective what can we as military leaders do to keep these troops in?

7. How valuable are the computer networks to your operations (1 - not important at all, 2 - somewhat important, 3 - moderately important, 4 – very important, 5 – critically important)

Glossary

ACSC	Air Command and Staff College
AFCA	Air Force Communications Agency
C4I	Command, Control, Communications, Computer Systems and Intelligence
CBT	Computer Based Training
CFETP	Career Field Education and Training Plan
CIO	Chief Information Officer
DOD	Department of Defense
IS	Information System
IT	Information Technology
O&P	Outsourcing and Privatization
O/PTN	Operationalizing and Professionalizing the Network
OJT	On the Job Training
SA	System Administrator
SMS	System Management Server
SRB	Selective Reenlistment Bonus
USAF	United States Air Force

Bibliography

"1998 3CXXX Selective Reenlistment Bonus. "Available from http://www.afca.af.mil/3c/docs/SRBSC.doc.

"1998 Monthly Basic Pay Table. "Available from http://www.dfas.mil/money/milpay/paychart/1998.

"Air Force Announces Reenlistment Bonus Changes." *Air Force News*, May 1996. Available from http://www.af.mil, May 1996.

Air Force Instruction 33-115. *Network Management*, June 1998.

Brandel, Mary. "Get me Out of Here." *Computer World*. Available from http://www.computerworld.com/home/print.nsf/all/9902158FB2.

Briefing. Air Force Communications Agency. Subject: 3C Career Field, October 1998, available from http://www.afca.scott.af.mil/3c.

Briefing. Air Force Communications Agency. Subject: 3CXXX Manning Statistics, 31 December 1999, available from http://www.afca.scott.af.mil/3c/manning.html.

Briefing. Air Force Communications Agency. Subject: 3CXXX Manning Statistics, January 1999, available from http://www.afca.scott.af.mil/3c/manning.html.

Briefing. Air Force Communications Agency. Subject: 3CXXX Manning Statistics, 17 June 1998, available from http://www.afca.scott.af.mil/3c/manning.html.

Briefing. Air Force Communications Agency. Subject: Certifying Network Professionals and Licensing Network Users, 29 October 1998, available from available from http://www.afca.scott.af.mil.

Briefing. Air Force Communications Agency. Subject: Quarterly Career Field Health Update, 15 May 1998, available from http://www.afca.scott.af.mil/3c.

Briefing. 333rd TRS/TTC. Subject: Basic 3C0X1 Course Details, available from http://www.keesler.af.mil/333trs/cflight/ops/new_ers.

Cole-Gomolski, Barb. "Techies want more than pay." *Computer World*, 29 June 1998. Available from http://www.computerworld.com/home/print.nsf/all/98062953C2.

"Communications-Computer Systems Operations Career Field Education and Training Plan (CFETP)," 8 April 1996. Available from http"//www.afca.scott.af.mil/3c/training.htm.

"Defense Secretary announces significant pay and retirement improvements for FY2000." *Air Force News,* 22 December 1998. Available from http://www.af.mil.

Earls, Alan. "Retention Getters." *Computer World*. Available from http://www.computerworld.com/home/online9697.nsf/all/980209retention.

"Employee Retention in Information Technology the solutions." Available from http://contentedcows.com/IT_employee_retention.htm.

Engler, Natalie. "Jobs Forecast '98: Desperate Measures." *Computer World*. Available from http://www.computerworld.com/home/print9497.nsf/all/SL52crjobs1773A.

"Global Engagement: A Vision for the 21st Century Air Force." CD-ROM.

Helphenstine, Paul. "Consider all Options to Keep Enlisteds." *Air Force Times*, vol. 58 issue 32 (16 March 1998): 1.

Herman, James, Theo Forbath, and Leighton, Chip. "A Return-on-Investment Analysis of Enterprise-Scale use of Microsoft's System Management Server (SMS)." *Northeast Consulting Resources, Inc*., 18 August 1997. Available from www.ncri.com/publish/herman_articles/sms_reports/sms_report.html.

Hoffman, Tom. "CIOs Share Retention Tips." *Computer World*. Available from http://www.computerworld.com/home/print.nsf/all/981102739A.

Hurley, Hanna. "Payday's Payoffs: Earn the Maximum Wage." *Network Magazine,* vol. 13, no. 7 (June 1998): 34-46.

Interview prepared by research group. January 1999.

Kirby, Sheila Nataraj and Harry J. Thie. "Managing the Enlisted Force: Whistling in the Wind?" *Armed Forces & Society*, vol. 24, no. 4 (Summer 1998): 567-587.

Lempe, Major Scott. *"The Impact of the Drawdown on People*." Maxwell AFB, AL: Air University, Air Command and Staff College Research Paper, 1998.

Melymuka, Kathleen. "Kraft's 5% Solution." *Computer World.* Available from http://www.computerworld.com/home/print.nsf/all/981102725A

"NCO Retraining Program Begins." *Air Force News*, June 1995. Available from http://www.af.mil.

O'Sullivan, Elizabethann and Gary R. Russel. *Research Methods for Public Administrators.* White Plains, NY: Longman Publishers USA, 1995.

Pittenger, Linda. "Creative Solutions for Attracting and Retaining Key IS Personnel," 29 April 1998. Available from http://www.coba.unt.edu/isrc/9798prog/apr-syn.htm.

Pulley, John. "Running on Empty." *Air Force Times*, vol. 58, issue 32 (16 March 1998): 3.

"Reenlistment Bonus Program Expanded." *Air Force Times*, 4 January 1999, 8.

"Retraining Opportunities Open to NCO." *Air Force News,* July 1996. Available from http://www.af.mil.

Scileppi, Gre.g., "Ramping up your IT Retention." *Computer World*, 20 January 1998. Available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

Scheier, Robert. "IS money can't buy Happiness." *Computer World*, 24 February 1997. Available from http://www.computerworld.com/home/print9497.nsf/all/SL0224rs.

Shelton, General Henry H. "A Word from the New Chairman," reprinted from Joint Forces Quarterly, Autumn-Winter 1997-1998.

"SRB List Undergoes Changes After Semi-Annual Review." *Air Force News*, 23 July 1997. Available from http://www.af.mil.

Stevens, Terry. "Provide more Guidance to Enlisteds." *Air Force Times*, vol. 58 issue 24 (19 January 1998): 29.

Telephone conversation with MSgt Mark Behrle, AFCIC/XPF. November 9, 1998.

Telephone conversation with Mr. Whittmer, 333 TRS Curriculum Development. March 2, 1999.

Thibodeau, Patrick. "State IS Workers Seek Greener Pastures." *Computer World*, 17 March 1997. Available from http://www.computerworld.com/home/print9497.nsf/all/SL11states.

Velissaris, Christopher and Nancy Vercauteren. "Sizing up sign on bonuses." *Computer World*, 12 May 1998. Available from http://www.computerworld.com/home/online9697.nsf/all/980120careers.

Vivlino, Bob. "1998 Intranet/Web Managers' Salary Survey." *Network Computing*. Available from http://www.networkcomputing.com/918/websal98.html.

Vivlino, Bob. "Network Computing Salary Survey." *Network Computing*, 7 January 1997. Available from http://www.networkcomputing.com/802/802f3.html.

Vivlino, Bob. "Third Annual Network/IS Managers Salary and Job Satisfaction Survey." *Network Computing,* vol.9 (15 February 1998): 88-90. Available from http://www.networkcomputing.com/903/903f2.html.

Walsh, Tim. "Time to go?" *Computer World*, 16 March 1998. Available from http://www/computerworld.com/home/features.nsf/all/980316leave.

White Paper. Operationalizating and Professionalizing the Help Desk, 25 January 1999. Available from http://www.afca.af.mil/optn.

Williamson, Miryam. "Paying Through the Nose." *Computer World*, 24 November 1997. Available from http://www.computerworld.com/home/online9697.nsf/all/971124skills.

DISTRIBUTION A:

Approved for public release; distribution is unlimited.

Air Command and Staff College
Maxwell AFB, Al 36112